BOSTON
MEDICAL LIBRARY
8 THE FENWAY

Digitized by the Internet Archive
in 2017 with funding from
The National Endowment for the Humanities and the Arcadia Fund

https://archive.org/details/medicalannalsofd2193medi

BOSTON MEDICAL
★ [illegible] 12, 1932 ★
LIBRARY

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II JANUARY, 1933 NUMBER 1

SPLENIC RUPTURES

VINCENT J. DARDINSKI, M.D.

Associate Professor of Pathology and Parasitology, Georgetown University School of Medicine

In reviewing the recent literature on this subject one might be led to believe from the scattered case reports that this is a comparatively new development. But, as a matter of fact, it is a subject that was known centuries ago. For we find as far back as 1696 that Vanselow wrote a thesis entitled, "Historiam de Ruptura lienis," in which he distinguishes between spontaneous rupture of the spleen and rupture due to external causes.

In 1855 Collin writing on this subject stated: "Excessive tension of the capsule from great congestion of the parenchyma and intracapsular vessels was one of the chief reasons of splenic rupture." In the same year Schnell described the symptoms of spontaneous rupture which he believed to be quite characteristic. These were pain in the lower left lateral costal region, dyspnea, paleness, claminess, increasing abdominal dulness and rapid death.

In 1877 Martin classified ruptures of the spleen as: (1) spontaneous, without external violence; (2) traumatic, in which the spleen was normal before the rupture; (3) mixed rupture, in which the spleen was already abnormal or diseased and was ruptured by trauma. Further study of this subject reveals that such a classification is no longer tenable because it is incomplete. This lack of adequate classification undoubtedly is due to the fact that no one individual has the opportunity of seeing many cases.

In the literature one finds many reports of cases in which rupture had occurred, but nowhere is there a classification which includes the various types of ruptures.

It is with the object in mind of classifying splenic ruptures that this paper is written, together with the hope that the classification submitted will help in the understanding of this most interesting condition.

Interest in this condition, however, does not rest in the fact that it is a relatively uncommon condition, but in the fact that it is practically always a baffling diagnostic problem.

Recently, having had the opportunity of prosecting a case of splenic rupture, I was impressed with the importance of the fact that if anything is to be done for these cases it must be done without too much delay. It appears that the prognosis is directly dependent upon the length of delay. Therefore, it is of great importance to establish the diagnosis as soon as possible. In support of this statement I wish to refer to a recent article by Berger. In this he reports 167 fatal cases of splenic rupture, in which death was due to hemorrhage in 145. In 90 per cent of cases of the entire series hemorrhage was, therefore, the cause of death. In the other 10 per cent infection was responsible for death.

In order to make this subject more easily understood I have devised the following classification which I believe is complete and simple:

1. Rupture of apparently normal spleen.
    a. Spontaneous rupture.
    b. Traumatic rupture.
2. Rupture of abnormal spleen.
    a. Spontaneous rupture.
    b. Traumatic rupture.
3. Traumatic rupture of the spleen with delayed hemorrhage.
4. Intracapsular hemorrhage.

TRAUMATIC RUPTURES

Of all the various types of rupture the traumatic is by far the most common. It is commonly produced by a kick, blow, fall, stab wound, gun shot, crushing, etc. Whether it occurs in a normal or abnormal spleen probably makes little difference as far as the immediate outcome of the case is concerned. The symptoms and signs in both are practically the same, and a diagnosis in these cases is not as a rule difficult. According to Quenu and others a history of a recent trauma in the left hypochondrium together with a certain degree of persistence of contraction of the abdominal wall, normal temperature and symptoms of internal hemorrhage should lead one to make a diagnosis of splenic rupture without much hesitancy. However, it is important to bear in mind that the degree or severity of trauma necessary to produce rupture of a spleen which is already abnormal may be almost negligible, and should not be taken too lightly.

The following is a list of conditions in which the spleen, already abnormal, was ruptured by trauma:

pregnancy (Kotschnew)
malaria (Besnier)
typhoid fever
leukemia (lymphoid and myeloid)
syphilis
hepatic cirrhosis
tuberculosis
hemophilia
capsular varices
typhus fever
anemia
eclampsia
relapsing fever
infarct (Picard)
abscess
aneurism
purpura
cysts (Picard)
Banti's disease
Gaucher's disease

A previous history of any one of these, or any other condition in which the spleen is known to be enlarged, plus a history of trauma over the splenic region, followed by symptoms of shock, should always suggest splenic rupture.

SPONTANEOUS RUPTURES

Spontaneous ruptures of the spleen are probably the most baffling of all and are generally undiagnosed. One of the chief reasons for this is that the condition is not suspected.

Of the abnormal spleens the malarial diseased spleen is the one most commonly ruptured spontaneously. Rupture occurring in normal or apparently normal spleens is a very uncommon condition. Up to the present the literature contains only 15 such cases. The fifteenth case of this nature was reported recently by me. However, a résumé of this case is cited here for it presents a fairly definite syndrome which appears to be characteristic of spontaneous ruptures whether occurring in a normal or abnormal spleen.

REPORT OF CASE OF SPONTANEOUS RUPTURE OF THE SPLEEN

The patient, a colored man aged 40 years, was admitted to Georgetown University Hospital in the morning of January 25, 1932 with the chief complaint of pain and swelling in the upper right abdominal quadrant and shortness of breath. The duration of these symptoms was only 6 weeks. The remainder of his history together with his past and family history was irrelevant. On examination the only important finding was a large, tender, nodular mass in the right upper quadrant and edema of the tissues of the abdomen. At noon of this same day while lying in bed the patient complained of a sharp, severe, sudden pain in the left side which gradually diminished but did not entirely disappear. On the 3d day after admission he again complained of another sharp, sudden, severe pain in the left side in the lower lateral costal region radiating to the left shoulder. Symptoms of shock quickly followed this second complaint and he died 3 and-a-half hours later. At necropsy a massive peritoneal hemorrhage was found. Most of the clotted blood was found below the left lobe of the liver and around the spleen. A rupture of the spleen about 2 cm. long was found extending over the border of the lower pole from the convex to the concave medial surface. The capsule was markedly wrinkled. The liver in this case contained a primary carcinoma producing a greatly enlarged organ. Microscopically nothing abnormal could be found in the spleen and the gross diagnosis of the liver was confirmed. The cause of death in this case was not suspected.

The course and outcome of this case is fairly characteristic of the group. That a definite syndrome is present cannot be denied. A sharp, sudden, severe pain in the left lower thoracic region is rather suggestive. This is especially important and more definite when the pain radiates to the left shoulder (Kehr's sign). Increasing fullness in the left hypochondrium with a failure to shift when the position of the patient is changed has been designated as Ballance's sign and is another aid in the diagnosis, but it is one that is seldom elicited.

TRAUMATIC RUPTURE WITH DELAYED HEMORRHAGE

In the French and German literature this type of rupture has been labeled, "Two-stage rupture of the spleen." Recently McIndoe reviewed the literature of this type of rupture and found only 46 cases. Here again one finds a definite syndrome with the sequence of events probably more dramatic than in any of the other groups.

In order that the reader may more readily understand what type of rupture is referred to under this heading the case of McIndoe may be cited:

> "A young man who while cutting trees was hit on the left side by a falling branch. It did not knock him down but immediately he noticed severe pain in the left side and had to lie down. After 10 minutes he continued to work throughout the remainder of the day with residium of some pain. The following day pain was worse so he consulted a physician who was unable to find anything wrong. Accordingly he worked 7 more days, although he still complained of nagging pain in the injured region. On the morning of the 9th day after the original injury he experienced a sudden violent pain in the left side which extended to the back and up into the left shoulder. In 30 minutes he collapsed. On the 10th day he was admitted to the hospital in shock and practically exsanguinated and with physical signs of a large hematoma in the left side of the abdomen. At exploratory operation a large hematoma was found occupying the left half of the abdominal cavity. The spleen was lying in the clots and shattered into 5 distinct fragments. The whole mass with the spleen was removed and the pedicle was tied off. Patient recovered and is well."

Such cases represent only those of subcutaneous injury of the spleen in which it is certain that the primary rupture is followed by complete or almost complete hemostasis for a latent period of more than 48 hours and this by delayed hemorrhage of dramatic onset and fulminating character. This group in essence is a combination of the two preceding groups with a latent period or period of symptomatic silence. The latent period in the cases reported was found to vary from 48 hours to 6 months.

What actually takes place during this latent period is difficult to say, but it apparently represents an interval during which subcutaneous oozing is taking place; because, although the period has been termed symptomatic silence, it is probably more relative than absolute since at no time is the patient entirely symptom-free. A history of dull aching or nagging pain can practically always be elicited from the time of trauma up to the time of final massive peritoneal hemorrhage which occurs practically always in a spontaneous manner.

The types of injury to the spleen at the primary injury in this group are divided into three classes: 1. Minor superficial capsular ruptures and slight splenic contusions producing parenchymal ecchymoses; these usually heal, leaving a superficial scar with a few perisplenic adhesions. 2. Intrasplenic hematomata and subcapsular hemorrhages without capsular rupture. The hematoma may be single or multiple. These hemorrhages have a tendency to spread laterally beneath the capsule, stripping it up either partially or completely and forming a layer of clotted blood completely investing the more normal and deeper parts of the organ. The result is that the capsule is distended to the bursting point or that the intrasplenic tension becomes sufficiently high to control further bleeding. In either case the spleen becomes exceedingly vulnerable to further trauma, particularly since the nutrition of the capsule is interfered with. 3. Rupture of the capsule and parenchyma with the formation of a perisplenic intraperitoneal hematoma.

It can readily be seen why this group has been termed "two-stage rupture." The first stage includes the trauma with the initial rupture, during which the signs and symptoms are the same as those already mentioned in traumatic ruptures. However, the symptoms are not as severe and the patient apparently makes a rapid recovery except for some residual, persistent dull-aching pain in the left, lower, lateral thoracic region. With this symptom he enters the latent period unaware of the seriousness of his condition. After an indefinite length of time, the picture changes suddenly, following perhaps some undue effort or straining. The dull ache now changes to a sudden, sharp, severe lancinating pain in the same region, which radiates to the shoulder and back, and the other symptoms already mentioned in the group of spontaneous ruptures follow rapidly. The picture in this period is quite typical of spontaneous rupture.

INTRACAPSULAR HEMORRHAGE

This heading has been chosen to describe the findings of a single case recently seen at operation. Because this case appears to be the only one of its kind that I have been able to find up to the present I wish to present the history and findings so that others might profit by it.

REPORT OF CASE*

The patient was admitted to St. Joseph's Hospital, South Bend, Indiana, on June 9, 1931 with a chief complaint of pain in the left upper abdominal quadrant. The onset of this symptom dated back 8 weeks and was first noticed 20 minutes after a hearty meal. This was followed by fullness and tenderness in the left upper quadrant. Similar attacks of pain had been present ever since and had become progressively worse. At no time was there any belching or vomiting. He had lost 20 pounds in weight in the past 8 weeks, and for the past 4 weeks he had been unable to work because of progressive weakness resulting from loss of appetite and fear of pain which he experienced at every meal. The past history was essentially negative. The physical examination was negative except that for the abdomen. In the left upper quadrant a mass the size of an orange was easily palpable and progressively enlarging. It did not move with respiration and was tender on pressure. It was of doughy consistency and dull on percussion. On auscultation no bruit was heard but friction sounds could easily be heard and felt. The liver margin was soft and rounded and extended 2 fingerbreadths below the right costal border. It was not tender. A splenic tumor was suspected and surgery advised. At operation 13 days after admission a tumor 6 inches in diameter was found in the lower pole of the spleen. The spleen itself was moderately enlarged. Splenectomy was done. Pathologist's report: "The specimen consists of a spleen which presents on the lateral surface in the region of the lower pole a thin-walled cyst containing about 700 cc. of bloody fluid and fibrin deposit. On section the cyst is well encapsulated. The cyst wall appears to be formed by a splitting of the splenic capsule. There was no visible connection between the cyst and the splenic parenchyma. Diagnosis: Intracapsular hemorrhage of the spleen." The postoperative course was uneventful and the patient was discharged 16 days after the operation.

This case appears to be the first of its kind ever recorded in which an intracapsular hemorrhage had occurred and splenectomy was done before a fatal intraperitoneal hemorrhage had time to develop. At no time could a history of trauma in the splenic region be elicited.

CONCLUSIONS

There is no doubt that the various types of splenic rupture have been and probably will remain baffling problems. This is chiefly because more material is not available for study and because many cases undoubtedly go unrecognized.

The traumatic ruptures are by far the most common and as a rule are quite apparent. The spontaneous ruptures, although not common, present a definite syndrome which if remembered should help greatly in making a timely diagnosis. The same is true for the group of traumatic rupture with delayed hemorrhage.

As to the group of intracapsular hemorrhage nothing definite can be stated. The signs of hemorrhage in the single case reported here were masked by gastrointestinal symptoms. No history could be obtained that would throw any light on the possible etiology. It is apparent that more similar cases are necessary before any syndrome can be deduced and established.

BIBLIOGRAPHY

BERGER, E.: Taken from Sajous' Analytic Cyclopedia of Practical Medicine. Philadelphia, F. A. Davis Co., 1928, **8**, 303.

BESNIER, E.: Dict. Encycl. des. Sc. Med., Art. Rate (pathologie). 1877, **2**, 516.

COLLIN, E.: Med. de med., chir. et pharm. militaires. Paris, 1855, **15**, 1 & 99.

DARDINSKI, V. J.: Spontaneous Rupture of an Apparently Normal Spleen. J. A. M. A., 1932, **99**, 831.

KOTSCHNEW, M. S., AND MANENKOW, P. W.: Zentralbl. f. Gynäk., 1930, **54**, 3106.

MARTIN, E.: Quelques considerations sur les ruptures de la rate. Montpellier, 1877.

MCINDOE, A. H.: Proc. Staff Meet., Mayo Clin., 1930, **5**, 1.

PICARD, P.: Bull. et. mém. Soc. nat. de chir., 1931, **57**, 248.

QUENU, J.: J. de chir., 1926, **28**, 393.

SCHNELL, O. H.: De ruptura lienis spontanea, Regiomonti Pr., 1855.

VANSELOW, M.: Historiam Ruptura Lienis, Erfordiae, 1696.

---

* I wish to express my appreciation to Drs. S. A. Giordano and Stanley Clark of South Bend, Indiana, for permission to use this case in this paper. Dr. Clark's surgical handling of the case is worthy of note.

HEADACHE FROM THE STANDPOINT OF THE NEUROLOGIST*

Antoine Schneider, M.D.

Professor of Clinical Neurology, Georgetown University School of Medicine

It will be impossible for me in the time assigned to do more than briefly outline those conditions in which headache as a symptom particularly interests the neurologist. These fall into three main groups from an etiological point of view and a fourth in which the etiology is unknown. The first and probably the largest group is that of cases of intracranial vascular disease. The second group is that of expanding lesions of the brain and of its coverings. The third group includes cases of infection of the central nervous system and the meninges. The fourth group is migraine.

Vascular Lesions

These include hemorrhage, thrombosis, embolism, arteriosclerosis and syphilitic vascular disturbances. In each of these, headache is often a prominent symptom. It may be prodromal or it may accompany or follow an acute vascular insult. Cerebral hemorrhage and thrombosis are frequently preceded for weeks or months by a nagging, intractable headache, circumscribed or generalized, and very often accompanied by other symptoms such as vertigo, tinnitus, irritability or insomnia. The diagnosis in these cases is usually clear after consideration of the age of the patient and evidence of concomitant peripheral or retinal vascular change. Subarachnoid hemorrhage is frequently ushered in without prodromata of any sort but is practically always accompanied by severe, excruciating headache, often localized in the occipital region, and by stiffness of the neck. Focal paralytic or sensory changes may be entirely absent and the patient's sole complaint be that of a splitting headache. Here the history of acute onset, often associated with physical exertion, and the evidence of blood in the spinal fluid will give the clue to the cause. In embolism, too, the onset is quite acute and when coma does not occur headache is the symptom most often complained of. Here, however, there are usually paralytic symptoms as well as physical evidence of cardiac pathology. Syphilitic cerebral endarteritis often makes itself known through headache, which is commonly supposed to be worse at night. Needless to say, the other systemic and serological signs of syphilis settle the diagnosis. As a symptom following trauma to the skull, headache is as common as vertigo and tinnitus. It is often the only symptom complained of and may persist for months following apparently slight injuries. Like most subjective symptoms it is very hard to evaluate as to severity and only too often disappears after financial compensation has been agreed upon.

Expanding Lesions

This group includes intracranial aneurism and abscess as well as newgrowths. In all of these conditions headache is a prominent complaint in a majority of instances. It is often the first symptom to appear and may for a long period of time be the only one. Headache due to tumor of the brain is most often generalized, but even when circumscribed it has very little localizing value. Possible exceptions to this rule are meningiomata and angiomata. Eventually other symptoms of increased intracranial pressure, such as vertigo and vomiting, make their appearance. However, a careful examination with particular attention to possible changes in the fundus, such as early choked disc, should make the diagnosis clear in many cases before the appearance of other symptoms has made prognosis or operative interference unfavorable or actually hopeless. Naturally such aids to diagnosis as lumbar puncture and X-ray films should be used whenever indicated. It may here be noted that the headache of increased intracranial pressure is intensified by sneezing, coughing or other actions that raise the pressure still more. Brain abscess presents much the same symptomatology as tumor in regard to headache, which may be present for months during its latent period. Here the history and the presence of a primary focus are all-important.

---

* Read before the Society, November 16, 1932, as part of a symposium on the subject of headaches.

INFECTION

This group includes particularly the meningitides of all types. In no other disease with the exception of migraine—if this can be called a disease rather than a symptom—is headache an earlier or more constant symptom. When this is associated with fever, leukocytosis and stiffness of the neck, the diagnosis is usually obvious. The headache is most often diffuse, with a tendency to extend down the back of the neck. Except for spinal fluid changes, headache may be for some time the only symptom of tuberculous meningitis. Encephalitis occasionally manifests itself with headache as a presenting symptom, but here the slight degree of spinal-fluid change and the appearance of other more typical symptoms serve to distinguish the condition. Headache often ushers in an attack of poliomyelitis, and along with anorexia and general malaise may be the only symptom noticed until the onset of paralysis.

MIGRAINE

This is a symptom-complex characterized by unilateral headache, paroxysmal in type, accompanied by ocular and gastric disturbances and with a tendency toward periodicity. There is frequently a hereditary or at least familial history of similar disturbances or of those of a convulsive nature. Many migrainous families show a strong epileptic taint also. The etiology of migraine is as yet unsettled, the most probable explanation being that of a transient vascular spasm on a sympathetic basis.

I have deliberately avoided reference to headache which appears in conjunction with many of the neuroses, as I do not feel qualified to discuss it from the point of view of its etiology in this connection. I need only say that the diagnosis of headache of psychogenic origin should be made only in the absence of signs pointing to organic disease.

Now a word as to treatment. In practically all of these conditions the type of treatment is clearly indicated once the diagnosis has been definitely made. For instance, in cerebral arteriosclerosis, rest, dietary and supportive treatment should be ordered. In brain tumor and abscess operation is often performed. In meningitis spinal drainage and the use of serum when this is indicated are the main methods of treatment. It is practically only in the treatment of the acute vascular accidents such as intracerebral or subarachnoid hemorrhage that there is any real difference of opinion. As regards lowering an increased intracranial pressure, some believe that the patient should be left strictly alone. I, personally, am of the opinion that reduction of a high intracranial pressure results often in at least symptomatic improvement. For migraine the coal-tar products are usually recommended at the time of the attack. Barborka of the Mayo Clinic, applying to migraine the same therapy as to epilepsy, uses a ketogenic diet with some encouraging results. Unilateral cervical sympathectomy has also been attempted.

Finally, I should like to present some of the views as to what may be called the "anatomy of headache." It was the opinion of Auerbach that headache resulted from stimulation of the dural nerves, most of which are derived from the trigeminal. O'Connor speaks of reflex headache in which pain in the peripheral distribution of the trigeminal nerve is referred to its dural endings. Elsberg brings forth a good deal of evidence to show that headache from change in the intracranial pressure, either in the nature of an increase or decrease, results from stimulation of centers in the region of the third ventricle, possibly in its thalamic lateral walls. He bases this assumption on observation of cases of cerebrospinal-fluid block. When the block was below the third ventricle reduction of pressure never caused headache no matter how fast the fluid was withdrawn nor how much of it was taken off. On the other hand, when the block was above the third ventricle, typical lumbar puncture headache frequently supervened.

As against Auerbach's view we have recorded instances of cranial operations done under local anesthesia in which traction upon the dura and distention with normal salt solution caused no subjective sensation of discomfort. Perhaps the dura is analogous to the intestine in that it will respond maximally to comparatively slight disturbances but will not react to gross insult.

As regards referred pain from trigeminal peripheral branches to dural endings there are also several objections. In the first place, pain in the face and scalp is ordinarily promptly referred back and localized to the spot at which the noxious stimulus was applied. And again in cases of greatly increased intracranial pressure and even of localized meningeal disease, in which one would certainly expect dural endings to be stimulated, no reflex pain in the opposite direction is experienced. Also irritation in the region of the trigeminal ganglion and sensory root, while producing severe, localized, facial pain, practically never produces orthodox headache.

It seems to me that Elsberg's hypothesis is by far the most attractive. It certainly caters to our natural desire for functional localization as expressed in our constant search for "cerebral centers." We know that in the normal individual under normal conditions the cerebrospinal-fluid pressure is remarkably constant. True, the pressure varies considerably in different persons, each having his own optimum. Is it not reasonable to suppose that disturbance, particularly sudden disturbance, of the pressure relations within one of the most highly organized tissues of the body will result in some recognizable expression of this disturbance? Elsberg's theory, supported as it is by the pathological evidence in his cases, explains for the first time the so-called "lumbar puncture" or "low pressure" headache. Again many patients with extremely high intracranial pressure do not have headache when the pressure has increased gradually over a long period of time but do have it when the pressure is suddenly lowered, indicating probably that the postulated "center" is capable of adaptation to gradual change. Another example tending to support this theory is the observation that tapping a greatly dilated, occluded lateral ventricle does not result in headache, while removal of fluid from its comparatively normal fellow that is still in communication with the third ventricle may cause severe pain.

While this in common with other theories still lacks conclusive proof, it at least injects a hopeful note into our attitude towards the etiology of certain types of headache and may lead to more rational and successful methods of treatment.

BIBLIOGRAPHY

Auerbach, S.: Der Kopfschmerz, Berlin, 1912.
Barborka, C. J.: Texas State J. Med., 1932, **27**, 637.
Elsberg, C. A.: The Intracranial Pressure in Health and Disease. Baltimore, Williams & Wilkins Co., 1929.

HEADACHE FROM THE STANDPOINT OF THE RHINOLOGIST*

S. A. Alexander, M.D.
Washington, D. C.

Headache is a symptom for which patients frequently come to us for relief. They are naturally interested not only in the relief of the pain, but in removing, if possible, the underlying cause. The rhinologist may be able to do this provided the cause is within his province. The nose is a very delicate organ and often shows very definitely signs of fatigue or other systemic disorders. A nasal disturbance may therefore be secondary to a systemic condition and not related causally to an existing headache.

Broadly speaking, nasal headaches may be divided into two types. The first is the deep, pulsating or throbbing type characteristic of the presence of pus within one of the sinus cavities when it is under pressure. The second is the sharp, shooting, neuralgic type which is due to irritation of the sensory-nerve endings within the nose or of their trunks, or to irritation of the nasal ganglion. Most nasal headaches are a combination of the two types.

The sinus headache is, of course, predominantly of the first type. It is due to the confinement of pus or mucus under pressure within one or more of the sinuses. The signs and symptoms are in proportion to the pressure within the activity. There is usually tenderness over the sinuses involved if they are superficial. When the inflammation is severe there is swelling and edema of the adjacent tissues. The maximum pain is usually referred to the frontal, temporal and occipital areas, to the region deep in and around the eyes, over the lacrymal bones and to the center of the head, depending upon the sinuses involved. Headaches associated with abscesses, cellulitis or marked edema of the orbital tissues are usually due to cavernous sinus thrombosis or to sinusitis. Sinus headaches often are not constant. The pressure gradually increases until it forces upon the ostium or the duct; then the pus drains out and the headache is relieved.

---

* Read before the Society, November 16, 1932, as part of a symposium on the subject of headaches.

It is not unusual for the pain to recur at the same time each day. Systemic toxemia usually exaggerates it. A large proportion of the patients are able to breathe through the nose freely. Practically all, when carefully questioned, give a history of the accumulation of mucus or phlegm in the throat or of the frequent need of a handkerchief. In frontal sinusitis sometimes the amount of pus seen in the nose is surprisingly small.

Ewing described before the American Ophthalmological Society, May 2, 1900, the symptoms of "vaccum frontal headache" as "inability to use the eyes for near work because of the headache which is produced thereby, and which is not relieved by glasses or eye treatment." It is accompanied by a tender point in the upper inner angle of the orbit. This is known as Ewing's sign. The morbid anatomy in these cases is simply a closure of the frontal duct and the absorption of air within the cavity. The point of tenderness mentioned is the attachment of the pulley of the superior oblique muscle. The bone is extremely thin there and the continual pull of the muscle exaggerates this tenderness.

The neuralgic type of headache is best exemplified by the syndrome of "nasal ganglion neurosis" first described by Sluder. I quote him as follows:

> "A patient presenting all the features will tell of a coryza of lesser or greater severity—sometimes astonishingly slight and often forgotten, or, it may have produced a post-ethmoidal-sphenoidal empyema of greatest intensity. A short time later, pain began at the root of the nose, in and about the eye, the upper jaw and teeth, sometimes also the lower jaw and teeth, and extending backward to the temple and about the zygoma to the ear, making earache; emphasized at the mastoid, but always severest at a point 5 cm. back of that; thence reaching backward by way of the occiput and neck, it may extend to the shoulder blade and shoulder (less often to the axilla and breast), and in severe attacks to the arm, forearm, hand, and even the finger tips. This is the most frequent picture, but at times there may be also a sense of 'stiff' or 'aching' throat; or of pain (oftener itching) in the hard palate; or pain inside the nasal fossae; or a feeling that the teeth are 'too long'; or a perverse (metallic) sense of taste (parageusia) (rare) or scotoma scintillans (rare) or salivation (rare). Itching of the shoulders has also been observed. The sense of taste is slightly less acute over the anterior two-thirds of the tongue on the affected side. Rarely, in the beginning or at the height of the attack it is slightly more acute. The arch of the soft palate is higher on the affected side; the uvula and dimple which forms above it on gagging are deflected to the well side. A slight blunting of sensation is found in the nose and throat as far down as the tonsil on the affected side. There may be a sense of stuffy ears, which are easily inflated with but short relief. I have construed these as tubes which are not opened normally by the levator palati; and that this happens because the motor function from the ganglion is lessened at the time of the attack of pain. As the pain subsides this symptom disappears. Itching of the upper extremity has been observed. Mild cases are described as a sense of tension in the face and stiffness or 'rheumatism' in the shoulders or neck. The ganglion is accessible for cocainization which relieves the pain."

We occasionally see this type of headache associated with the use of very strong medicines within the nose. If it is a true "ganglion neurosis" the symptoms immediately subside when the ganglion is cocainized. If the vidian nerve, however, is inflamed, cocainization of the ganglion does not relieve the patient.

In hypertrophic rhinitis there are headaches which are the result of enlarged turbinates pressing against a certain area of the septum. In vasomotor rhinitis headaches occur from lack of ventilation. Sometimes a spur of the septum presses against a sensitive area along the lateral wall of the nose. The most frequent and important headaches from the standpoint of the rhinologist fall, however, into the two main classes described above.

BIBLIOGRAPHY

EWING, A. E.: Quoted from Sluder, page 31.

SLUDER, G.: Nasal Neurology, Headaches and Eye Disorders. St. Louis, C. V. Mosby Co., 1927.

THE VALUE AND INDICATIONS OF INTRAVENOUS INJECTIONS IN PEDIATRICS*

ROBERT A. BIER, M.D.

Instructor in Clinical Pediatrics, Georgetown University School of Medicine

The field of intravenous therapy in pediatrics covers so much territory, that it will be necessary to consider the matter very briefly, only the salient points being touched upon.

I shall consider mainly those therapeutic agents used intravenously in conditions more common to children, omitting those used more frequently in adults.

The advantages of intravenous therapy are: 1. It assures accuracy of dosage; 2. it allows ease of administration of certain drugs; 3. it gives the maximum action in the minimum of time; 4. control of the patient and more definite results are possible; 5. drugs having no action by mouth and others which injected into the skin or muscle cause pain and necrosis may be given intravenously.

The objects of intravenous therapy are: (1) To supply blood; (2) to combat dehydration of tissue; (3) to promote dehydration of tissue; and (4) to bring about chemotherapy, including antibody stimulation and phagocytosis.

The first, and probably the foremost material for intravenous injection is blood. It may be whole blood, citrated blood, or blood plasma. Whole blood is less often used than citrated blood because of its more difficult administration directly in children. Blood plasma has its indication when the bactericidal and antibody properties are desired rather than the corpuscles with their hemoglobin.

The use of citrated blood, or hereafter called "transfusion," is very extensively used in pediatric practice. Following the order of Krahulik and Koch four groups of conditions are given as being indications for transfusions: (1) infections, with or without secondary anemia, (2) nutritional disorders with or without infection, (3) diseases of the blood, and (4) preoperative and postoperative conditions.

INFECTIONS

The late Dr. John Foote reviewed the cases of erysipelas at Children's Hospital and was of the opinion that transfusions of blood combined with erysipelas serum was of the greatest benefit. Schaffer and Rothman found that transfusion in erysipelas was of distinct value in reducing mortality. Following the lead of Tisdall and Brown many Canadian physicians use exsanguination transfusions in this disease.

Transfusions are of benefit in pneumonia even in face of cyanosis and impending circulatory collapse. Bass obtained favorable results from the employment of blood transfusions especially when anemia was a marked symptom. McLendon also reports favorable results with transfusions in pneumonia.

Mastoiditis, pyelitis, acute hemorrhagic nephritis, chronic carditis all may respond to an infusion of blood. In chronic illness such as empyema, several transfusions may be necessary to combat the anemia which is invariably present. Any long-continued illness will more than likely produce some degree of anemia. Transfusions in these cases serve two purposes, combating infection and helping to prevent or to cure the anemia.

NUTRITIONAL DISORDERS

Severe forms of nutritional disturbances in which there is marked loss of weight and dehydration often need the bolstering effect of a transfusion. Severe forms of nutritional disturbances, such as athrepsia and anhydremia, may be accompanied by infection or anemia or both. More than occasionally a long-standing infection will lead to athrepsia. These conditions, especially when accompanied by anemia, are often alleviated by the simple procedure of blood transfusion. Not only one transfusion is indicated, but many may be necessary. Without considering the beneficial effect on the anemia, the blood has a tonic and stimulating effect upon the general metabolism and resistance of the patient. Bakwin, Astrowe and Rivkin found that after blood transfusions in severe malnutrition the hemoglobin rose and that this rise persisted. The corpuscles remained for a long time in the circulation of the recipient. The plasma was soon taken up by the tissues.

---

* Read before the Society, November 9, 1932, as part of a symposium on intravenous therapy.

Powers blames the intoxication in severe diarrhea on the concentration of the blood due to the disarrangement in metabolism and vital function. Fluids should be forced, such as physiological salt solution parenterally, citrated blood intravenously and water orally. In the transfusion, 10 to 25 cc. of blood per pound of body weight, with a total of not less than 100 cc. or more than 200 cc. are used. The more dehydration is present the more blood is needed. If necessary the blood transfusions are repeated every 24 hours during the first few days. It may be stated here that small transfusions frequently repeated have more effect than occasional large ones.

DISEASES OF THE BLOOD

This is a common group of conditions in children requiring blood transfusions. One of the commonest of this group is the anemia which develops in prematurely born children. Nothing corrects this condition as readily as a transfusion. The theory of this anemia is that as a result of the premature birth the blood-forming organs have not fully developed. The action of the blood so introduced stimulates the recipient hematopoietic organs to greater activity. Blackfan and his associates have demonstrated the relationship between icterus gravis neonatorum and anemia of the new-born. Seven cases of severe anemia were treated with from 1 to 6 transfusions with complete recovery.

In sickle cell anemia there is nothing as yet to take the place of transfusions of blood. These must be repeated many times for even temporary relief.

Others of these blood diseases to be mentioned are Von Jacque's anemia, hemophilia with severe hemorrhages and purpura. Even if not permanent the temporary relief by transfusion of blood warrants its use.

In severe hemorrhages of the new-born blood transfusions are most gratifying in their results. Dr. Donnally and the late Dr. Foote, members of this Society, reported cases of anemia of the new-born so treated.

PREOPERATIVE AND POSTOPERATIVE CONDITIONS

Even though the surgical indications are to be covered in this symposium, I can not allow the opportunity to pass without mentioning the use of blood transfusions, before and after operations in children. Foremost among these are the operations for mastoiditis and pyloric stenosis, two of the most common operations in children and infants respectively; also, acute hemorrhage and shock, lateral sinus thrombosis and septicemia are important indications. Large superficial burns are treated by exsanguination followed by large blood transfusions.

OTHER FORMS OF INTRAVENOUS THERAPY

After blood transfusions the most frequently used forms of intravenous therapy are the injection of physiological salt solution, glucose in its lesser dilutions, Ringer's and Hartman's solutions. These solutions are used most frequently in dehydration and acidosis. They are often used in conjunction with blood.

Hoag and Marples suggest that in infants with oliguria and anuria, hypertonic solution of glucose (10 per cent) given intravenously, with hypodermoclyses of physiological salt solution, should be given during the acute stages of the disease. This leads quickly to diuresis and improved tissue turgor. In giving large amounts of physiological salt solution care must be taken that too much is not given since the high chloride content introduced into the blood stream would use up the available bicarbonate. Rapid changes in the blood caused by dehydration must be combated by fluids. These must be given intravenously because of the futility of trying to give them by mouth.

Powers in his paper on intestinal intoxication gives the advantages of glucose. If properly prepared it is non-toxic, increases the fluid content of the blood, supplies energy, and spares protein. It may be of value in combating acidosis, and if given in hypertonic solutions it has been said to bring about the rapid absorption of parenterally administered fluids and to promote diuresis.

Recently Karelitz and Schick have used venoclysis (or continuous infusion) in the treatment of dehydration due to vomiting or diarrhea or both. A 5 per cent solution of glucose in normal salt solution or Ringer's solution is used. Amounts ranging from 125 to 250 cc. are given in 15 to 20 minutes, then more slowly 4 to 10 drops a minute (500–800 cc. a day) by continuous infusion into the vein. This is kept up for 48 or more hours as needed. Starvation is enforced for 10 to 12 hours, then 10 to 20 cc. of water is given by mouth every 2 hours. The patients showed almost immediate general improvement after the intravenous infusion of glucose solution and transfusion of blood. The blood may be given through the same apparatus.

Acidosis due to diabetic or uremic coma may be successfully treated by a 5 per cent solution of soda bicarbonate into the vein.

In contrast to the above, the intravenous route is also used to deplete the body of fluids, or to remove excess fluids from isolated parts, notably the brain. This is necessary in edema due to disturbed cardiac or renal function or other causes. Glucose solution up to 40 per cent may be used. This not only has a dehydrating effect upon the tissues but also acts as a diuretic. Magnesium sulphate in 2 per cent solution may be used, but the blood pressure must not be reduced too rapidly. An amount equivalent to 0.2 of a fluid ounce per pound of body weight is given slowly, the injection being stopped when the blood pressure is still 10 to 20 cm. above normal. Calcium chloride (0.2 per cent) and magnesium sulphate (2 per cent) may be given together intravenously to reduce edema. The same precautions apply as mentioned above when magnesium sulphate is used alone.

Magnesium sulphate solution (2 per cent), hypertonic glucose solution (25–40 per cent) or sodium chloride solution (15 per cent) are used for the increased intracranial pressure due to acute infections, uremia, serous meningitis, acute stages of encephalitis and purulent meningitis (Griffith and Mitchell). The effect is usually manifested within a few hours and may be maintained over a long period by daily repetition of the injections. These should be given slowly at body temperature, 10 minutes being consumed in giving 15 to 20 cc. of a total of 50 to 150 cc.

Some of the more specific sera are used intravenously. When giving sera intravenously particular care must be taken to test the patient for sensitivity to the serum to be used. Herrick believes that the infection in meningococcus meningitis is a general one and that serum should be given intravenously, especially in what he calls the bacteremic stage. This stage represents the period of general infection before the meningeal infection has taken place. The advantage of giving serum intravenously is that much larger amounts can be given. This route is more efficacious in enabling the serum to reach the ventricles through the choroid plexus. Children are given 15 to 60 cc. of serum, and this amount is repeated in 12 hours and again in 24 hours if necessary. If possible, the type of organism which is agglutinated by the serum is determined and that serum given which possesses the highest titer.

Neoarsphenamine is given in cases of syphilis intravenously once a week for 12 doses. This is of less value than in adults on account of the pain incident to its use and the difficulty in getting a needle into a child's vein. Some of the newer preparations of bismuth, arsenic or mercury prepared for intramuscular injection are to be preferred.

In severe cases of diphtheria when quick action is desired as in laryngeal obstruction, the antitoxin is given intravenously. Sufficiently large doses, 20 to 50 thousand units, should be administered. Intravenously, diphtheria antitoxin is mobilized in one-tenth the time as when given subcutaneously and in one-fourth the time as when given intramuscularly.

Some miscellaneous forms of intravenous therapy are the use of 6 per cent solution of acacia in severe shock and hemorrhage, salyrgan or novasurol in edema, dyes such as gentian violet, mercurochrome (220 Sol.) and acriflavin hydrochloride in septicemia, calcium chloride in 10 per cent solution in tetany, tetanus antitoxin intravenously in conjunction with avertin anesthesia, and typhoid vaccine in chorea.

One of the most recent advances in intravenous therapy is the use of acacia in edema due to the disarrangement of plasma proteins (Hartmann and Senn). In nutritional edema without vomiting or diarrhea, and in severe nephritis and nephrosis, acacia is used to keep up plasma proteins. In these conditions when the plasma albumen cannot be brought to, and maintained at a level sufficiently high to prevent edema, the intravenous administration of acacia has proved of value in maintaining a more normal plasma pressure. One must give a 30 per cent solution of acacia with or without sodium chloride in an amount sufficient to produce a plasma-acacia concentration of about 2 per cent and repeat its administration when the diuretic effect has ceased.

BIBLIOGRAPHY

Bakwin, H., Astrowe, P. S., and Rivkin, H.: Transfused Blood in Infants With Severe Malnutrition. Am. J. Dis. Child., 1927, **33**, 442.

Bass, M. H.: The Association of Anemia and Pneumonia in Infants. Am. J. Dis. Child., 1925, **29**, 318.

Blackfan, K., et al.: Erythroblastosis Fetalis. J. Pediat., 1932, **1**, 269.

Foote, J. A.: Erysipelas in Infancy and Childhood. South. M. J., 1930, **23**, 29.

Griffith, J. P. C., and Mitchell, A. G.: The Diseases of Infants and Children. Philadelphia, W. B. Saunders Co., 1927.

Hartmann, A. F., and Senn, M. J. E.: Studies in Edema, With Particular Reference to the Therapeutic Value of Acacia. Am. J. Dis. Child., 1932, **44**, 673.

Herrick, W. W.: Meningococcus Infections Including Meningitis. Bull. New York Acad. Med., 1931, **7**, 487.

Hoag, L. A., and Marples, E.: Acid-Base Status in Dehydration Accompanying Diarrhea in Infants; Effect of Treatment With Parenteral Fluids. Am. J. Dis. Child., 1931, **42**, 291.

Karelitz, S., and Schick, B.: Treatment of Toxicosis with Aid of Continuous Intravenous Drip of Dextrose Solution. Am. J. Dis. Child., 1931, **42**, 781.

Krahulik, L., and Koch, L. A.: Blood Transfusion in Diseases of Infants and Children. Am. J. Dis. Child., 1930, **39**, 34.

McLendon, P. A.: Personal Communication With Author.

Powers, G. F.: Intestinal Intoxication. Am. J. Dis. Child., 1926, **32**, 232.

Schaffer, A. J., and Rothman, P. E.: Treatment of Erysipelas With Blood Transfusion. Am. J. Dis. Child., 1927, **33**, 116.

Science Series. No. 12

FUNCTIONS OF THE SKIN

Walter Teichmann, M.D.
Washington, D. C.

The functions of the skin, some of which have been definitely established while others are little known, are important for more than one reason. In this resumé of the subject I shall limit myself to some of the more important points and refer the reader who desires more detailed information to the works mentioned in the bibliography.

The physiochemical defense of the skin is exercised by its well known properties, elasticity, oiliness, humidity, etc. The oiliness of the skin, which is the result of the production of acid fats, helps to maintain, according to Scarpellini, the acid balance of the surface. This balance is partially maintained also by acid secretions of the sweat. The elasticity of the skin, which is due to the network of collagenous and elastic fibers, has been extensively studied by Schmidt-LaBaume. Schade has constructed a small device for measuring the elasticity (elastometer).

The ideas regarding the permeability of the skin have been much changed in the last few years. Absorption by the skin depends on the substance to be absorbed, the condition of the skin and the form of vehicle for incorporation. Water cannot be absorbed by the undamaged skin, although the obstacle of the fat coating to the absorption can be overcome by long exposure to water. In this case the water is taken up by the cholesterin of the skin fats and in this way brought in contact with the stratum corneum, which, being strongly hygroscopic, easily absorbs it. An absorption of water by deeper layers of the skin is, according to Rothmann, not possible. Soluble substances may be absorbed with the water and thus act on the underlying cellular, nervous and hemolymphatic elements.

The absorption of water and water-soluble substances explains the therapeutic experiences of balneotherapy, which may cause remarkable reactions of the entire system.

All lipoid-soluble substances can be absorbed and the absorption of non-fatty substances can be augmented by incorporation into ointments (Rothmann).

The formation of pigment also seems to contribute towards the defense of the skin and of the system against the action of the sun's rays, although this is not the only or more important function of the pigment.

The cutaneous vascular apparatus responds to external and internal stimuli, and the system is enabled by means of this network to regulate the temperature until the external conditions remain within certain limits. According to von Breemen, the skin reacts with its vasomotor nerves as a single organ, so that a local stimulus results in a reaction of the entire skin surface, except that of the head. The wrists are especially sensitive, and for this reason bathing the wrists in cold water is at times refreshing. According to Mueller, not only the skin but sometimes the mucosa responds to vasodilator or vasoconstrictor stimuli, and there is also a reaction of internal organs, especially of the liver and of the splanchnic organs, in the sense that a vasodilation of these organs corresponds to a constriction of the cutaneous vessels and vice versa. Ruhmann recently confirmed these findings and showed that there existed a relation between the cutaneous heat stimuli and the mobility of the stomach. He believes that the cutaneous vasodilation of vagal origin causes vagal reactions in the organs corresponding to the cutaneous segment, and that the sympathetic reaction of vasoconstriction causes sympatheticotonic phenomena in the corresponding organs. Nardelli, however, is of the opinion that the matter is not so simple, although he is certain that the phenomena of regulation of the heat of the skin are of great importance for the functions of the other organs.

The skin is possessed of special receptors for the various sensations, such as the sensations of cold, heat and pain. The corpuscles of Meissner serve for the sensation of touch, the corpuscles of Krause serve for receiving that of the cold, and the corpuscles of Ruffini serve for the perception of heat, while the nerve ends of the epidermis serve for perceiving pain. So far no special terminal organs for the various sensations have been found in the mucosa. This differentiation of perception in the skin is very great, so that in that portion of the skin where the respective nerve ends are absent certain stimuli are not perceived.

Frey found that the sensations of pain and touch may exist independently of one another, and pain may be caused also by direct excitation of the nerve trunk. Inasmuch as all sensations, except the sensation of touch, may be caused also by stimuli acting on the center, variations and disturbances of the sensitivity of the skin may be produced also by internal causes (painful zones of Head) or by central or intracutaneous causes.

The secretion and excretion of the skin are limited, physiologically, to the elimination of the sweat, fats and desquamation. Cutaneous secretion completes the secretion of other organs, and for this reason is specific for certain products of metabolism. When an organ which has a task of eliminating a certain product has become weak for some reason, the skin may assume a vicarious function, and meet the need by increase in its own activity. This results in an increase in the function of its glands, an increase in desquamation and finally in inflammatory processes.

Physiologically the variations of the cutaneous secretion are great within certain limits, and it has been found that heat exercises the greatest influence.

The loss of water from the skin occurs in two different ways: physically, as a diffusion of water vapor through the thin epidermal layer (perspiratio insensibilis), and physiologically, as excretion of the sweat glands. Besides, the skin serves as a water depot which can supply water to the organism, if needed, and it can store water when there is an over supply. Engels was able to show that after intravenous injections of large amounts of water one-sixth was stored in the skin. Animals in which the thyroid gland is absent and myxedematous persons take water which is offered to them greedily, and hold it sponge-like in the connective tissue of the skin. On account of the existing sluggish cell activity in hypothyroidism the NaCl and H_2O metabolism is much retarded.

According to Moog and Hauck the ingestion of 1000 cc. of liquid at one time does not increase the sweat, but the ingestion of 3000 cc. a day for several days in succession causes an increase which may be from 7 per cent to 40 per cent, due to the fact that the cutaneous regulatory apparatus enters into action. The substances which may pass into the cutaneous secretions are many, but not all of them leave the elimination apparatus unaffected. Whether toxic dermatitis, as, for example, dermatitis caused by arsphenamines, enters into this class has not been ascertained. Mayr found in dermatoses with strong exudative symptoms, regardless of morphology and etiology, that the evaporation of water through the skin increases and the excretion of water through the kidneys correspondingly decreases.

The skin does not have a true endocrine function except in a wider sense as used by Hoffmann and termed "esophylaxis." The histological structure of the skin is more that of a nerve regulating organ than that of an endocrine organ. Therefore, Nardelli believes that the skin must be considered as a regulatory organ between the the vegetative nervous system and the glands of internal secretion. All the stimuli which act on the skin find a repercussion in the vegetative nervous system. In this manner air, light, sun, baths and actinic rays and possibly also the electric charge of the atmosphere are all stimuli which act intensely on the vegetative nervous system, especially when all or a great part of the skin surface is exposed.

The skin produces without or with stimulation such as light, massage, baths, etc., substances which act on the internal organs in such a way that a protection of the body against diseases results.

These changes cannot be demonstrated under physiological conditions, but they are visible after exposures to ultraviolet light. Certain products of the metabolism of cells are given off into the system only when there is an increase in metabolism, which makes the cell membranes more permeable. The increased permeability under the influence of light has been experimentally confirmed on plant and animal cells with colorimetric and electrical methods. Memmesheimer has found after prolonged massages histological criteria of increased cell metabolism. If a sufficient degree of stimulation has been reached, signs of degeneration are evident in the prickle cells in the form of changes in the nuclei and coagulation of the protoplasm. The basal cells do not degenerate even if they are in closer proximity to the source of light than parts of the stratum spinosum. It has been thought that the lower layers of the prickle cells and the basal cells produce a secretion which has the property to attract leukocytes. Lewis produced from the epidermis and the lymph of the intercellular spaces a product, which he called H.-substance, and which is said to have the characteristics of histamin. These findings were corroborated by Hosoya, Schilf and Watanabe, who found a substance in extracts of the skin, which stimulated the bowels of guinea-pigs and raised the blood pressure of an atropinized rabbit under ether anesthesia, which, they claim, points to the presence of a substance like histamin. They further believe that dermographism is due to histamin. This and similar substances (tyrosin) have also been found in the blood after radiation (Rothmann). Jena, through hydrolysis of the skin, obtained a substance which he called "detoxin." This is a group of amino acids similar to tyrosin and cystin, which he claimed has strongly detoxicating properties even against fatal poisons.

Another phase of the "esophylactic" function of the skin is the production of Vitamin D, in which field Windaus, Pohl and Hess have produced important facts. Windaus found that all stearins of the plant and animal tissues contain varying amounts of ergosterin, and as there are plenty of cholesterin and cholesterin-esters in the epidermis, it was to be expected, that the amounts of ergosterin which could be found in the upper layers of the skin would be activated by ultraviolet light and changed into Vitamin D. This has been proved in clinical experiments by Falkenheim, Sonne and many others.

That the skin is able to produce specific substances against bacteria (antibodies) has been frequently emphasized, and the fact that vaccination produces protection against smallpox serves to demonstrate this clearly. Jesionek believes that a mutual affinity exists between tubercle bacilli and fibrous elements of the skin, the tuberculous agents being able to dissolve solid parts of the fibrous tissue and liquid parts of the fibrous tissue being able to dissolve tubercle bacilli.

Since the skin contains histiocytes, endothelial cells of lymph and blood vessels and fibrocytes, it is part of the reticulo-endothelial system, which plays an important part in all immunizing processes and which is probably responsible for the drop in leukocytes in the peripheral blood following irritation of the skin (Mueller).

The importance of the skin in the determination of specific allergy with the help of the sensitization test is generally known and need only be mentioned.

The acidity of the skin is its defense mechanism against micro-organisms. The uninjured skin constantly maintains approximately the same hydrogen-ion concentration, but on different parts of the body different values have been observed, ranging from about pH3 to pH6. Some authors give values of pH4 to pH6.5. In examinations with regard to the importance of the hydrogen-ion concentration for the life of micro-organisms, Schade and Marchionini found that values of pH3 to pH5 can not kill micro-organisms, but that their growth, formation of toxins, etc., are greatly inhibited. They were further able to show that all fissures and erosions of the skin showed figures over pH7 (pH7.44) which is a reaction on the alkaline side, and this reaction represents the growth optimum for most of the micro-organisms. The same authors found that the skin surfaces of the axillary and inguinal regions become alkaline or neutral in reaction at puberty, following the development of the apocrine glands. Consequently, these areas, which in childhood are not attacked by epidermophyton varieties become easily infected with these organisms in adults. The same is said to apply in reference to the change of acidity of the scalp after puberty which tends to lead to spontaneous cure of microsporia. The appearance of seborrhea after puberty also seems to point to the change of certain properties of the scalp and other areas.

Scremin showed that the skin is able to increase its acidity by absorption, so that an increase of the hydrogen-ion concentration could be found after portions of the skin had been exposed for several minutes to an acid solution and had subsequently been thoroughly rinsed with clear water. This seems to explain the favorable action of wet dressings with acid solutions and the therapeutic effect of acid tar baths (Klingmueller).

BIBLIOGRAPHY

Böhm, A., and Vamos, L.: Dermat. Ztschr., 1931, **62**, 246.

Engels, W.: Arch. f. Exper. Path. u. Pharmakol., 1904, **51**, 346.

Hoffmann, E.: Die nach innen gerichtete Schutzwirkung der Haut. Berlin, S. Karger, 1927.

Hoffmann, E.: Dermat. Ztschr., 1930, **59**, 155.

Hosoya, K., Schilf, E., and Watanabe, K.: Dermat. Wchnschr., 1930, **91**, 1382.

Jesionek, A.: Dermat. Ztschr., 1928, **53**, 310.

Klingmueller, V.: Dermat. Ztschr., 1918, **25**, 9.

Lewis, T.: The blood-vessels of the human skin and their responses. London, Shaw and Sons, 1927.

Mayr, J. K.: Dermat. Ztschr., 1931, **60**, 413.

Memmesheimer, A. M.: Hautreize und Hautesophylaxie. Samml. zwangl. Abhandl. a. d. Gebiete d. Dermat. u. Syphilog., Halle, 1927.

Moog, O.: Hautfunktionspruefungen, Jena, 1928.

Müeller, E. F.: München. med. Wchnschr., 1922, **69**, 1506.

Nardelli, L.: La funzionalità della cute ed i vari metodi d'esame della stessa. Gior. ital. di dermat. e sifil, 1928, **69**, 1177.

Rothmann, S.: Handbuch der normalen und patholog. Physiologie. Berlin, Springer, 1929.

Ruhmann, W.: Deutsche med. Wschr., 1927, **53**, 1099.

Schade, H., and Marchionini, A.: Arch. f. Dermatol. u. Syph., 1928, **154**, 690.

Schmidt-LaBaume, F.: Arch. f. Dermat. u. Syph., 1928, **156**, 383.

Windaus, A., and Hess, A. F.: Nachr. Ges. der Wiss. Goettingen, 1926.

ABSTRACT OF PAPER READ BEFORE THE SOCIETY

"Agranulocytic Angina and Allied Conditions,"* by **Henry Jackson, Jr., M.D., Boston, Massachusetts.**

There are a variety of clinical conditions associated with an extreme leukopenia. Of these the most important are agranulocytic angina and overwhelming sepsis. Agranulocytic angina is a symptom-complex, characterized by a very low white-blood-cell count, ulcerative lesions of the mucous membranes, high temperature, great prostration and, as a rule, in untreated cases, death. Occasionally sepsis is accompanied by a progressive fall of the white-blood-cell count, and under these conditions the prognosis is equally grave. One of the major defenses of the body is lacking and treatment should center about the restoration of this defense as rapidly as possible. Leukopenia is seen in a variety of other conditions, as pernicious anemia and splenic anemia, aplastic anemia and occasionally Hodgkin's disease. But in these diseases the prognosis depends on the nature of the underlying condition rather than on the actual level of the white-blood-cell count. These miscellaneous clinical states with symptomatic leukopenia must be sharply distinguished from true agranulocytic angina and from overwhelming sepsis. The etiology of agranulocytic angina is unknown. From the study of a considerable number of cases we have come to the conclusion, however, that the blood changes precede and condition the well-known clinical picture. In the vast majority of instances the patients are women. Age does not appear to be a factor of great importance. The symptoms of agranulocytic angina are varied. In all cases there is marked lowering of the white-blood-cell count. Frequently the count is below 1000 per c.mm. If it is above 2000 per c.mm. the diagnosis is in doubt. Coincident with the marked fall of the white-blood-cell count there is a corresponding fall in the percentage of polymorphonuclear neutrophils. A total absence of polymorphonuclear neutrophils is not unusual. Very immature cells, particularly of the lymphocytic and monocytic series, are not infrequently seen. Stem cells may be present but they are rarely so frequent as to cause confusion with aleukemic leukemia. Blood platelets are essentially normal in number. The red-blood-cell count may or may not be slightly reduced. A red-blood-cell count below 2,000,000 per c.mm. should throw grave doubt on the diagnosis of pure agranulocytic angina. Hemorrhages into the skin or from the mucous membranes are rare. Their presence bespeaks leukemia or aplastic anemia and at least calls for caution in both diagnosis and prognosis. Prostration in agranulocytic angina is usually marked. The temperature is usually elevated, often markedly. Ulcerations of the mucous membranes are the rule. They may be mild and superficial or deep and gangrenous. Gastrointestinal symptoms are common. Jaundice is rare. The spleen may be slightly enlarged, but the enlargement of peripheral lymph nodes is not common except as a secondary complication. The onset of the disease is frequently abrupt. Much less often it is creeping. This latter type is more common in older people and is, as a rule, more resistant to specific treatment. Rarely the patient may come down with the disease and die within 48 hours. As to the course of the disease, occasionally spontaneous recovery occurs. This fact tenders the evaluation of any therapeutic measure difficult in any given instance. In certain cases there appears to be a definite cyclic course with rather regular recurrences of periods of leukopenia with or without attendant symptoms. The relation of this type of case to the more acute forms is problematical. A similar course of events may occur in certain cases of overwhelming sepsis. In all septic cases a progressive fall in total white-blood-cell count or an increase of young polymorphonuclear neutrophils at the expense of the mature forms is an ominous sign and calls for immediate and vigorous specific treatment. Should the white-blood-cell count fall below 1000 per c.mm. the prognosis is extremely grave. As in agranulocytic angina the main problem confronting the physician is that of restoring the white-blood-cell count to its normal level. Obviously, in this type of case foci of infection should also be appropriately treated, the underlying disease combated and the patient be given the best of general care, although overzealous local treatment may do more harm than good. A variety of therapeutic agents have been recommended in these conditions. Transfusions, non-specific protein shock, X-ray in minimal doses over the long bones, have all been used with varying degrees of success. The fact remains, however, that the mortality of untreated cases is 75 per cent, and that of cases treated with X-ray, heretofore the most promising therapeutic agent, is 53 per cent. In 1924 I demonstrated the presence of pentose nucleotides in normal human blood. It has long been known that nucleic acid and its derivatives when injected parenterally have the power to raise the peripheral white-blood-cell count. It seemed not illogical, therefore, to try these non-toxic nucleotides as therapeutic agents in diseases associated with leukopenia. To date, 80 such cases have been adequately treated with the mortality of 30 per cent against the usually accepted mortality in untreated cases of 75 per cent. In the usual case of either agranulocytic angina or overwhelming sepsis with leukopenia, 10 cc. of Pentnucleotide N. N. R. is injected intramuscularly twice a day until the white-blood-cell count has definitely risen. Thereafter 10 cc. is injected once a day until the white-blood-cell count has been normal for several consecutive days. In desperately ill cases 20 cc. or more is injected intramuscularly twice a day for 4 days. Then 10 cc. is injected twice a day until the white-blood-cell count has definitely risen, and thereafter treatment is given as in the usual case. General care is obviously important, but we deprecate the overzealous treatment of local lesions. We also advise against blood transfusions. No favorable results from pentnucleotide therapy are to be expected before the third day. Often both clinical and hematological improvement are delayed until the fifth day of treatment. The consistency with which both clinical and hematological improvement occur on or about the fifth day, irrespective of the previous duration of the illness, constitutes one of the reasons for believing that the therapy is actually efficacious. As a rule, the first sign of improvement is seen in the patient's general condition. At about the same time, a few young polymorphonuclear neutrophils appear in the blood, the white-blood-cell count starts to rise and the temperature begins to fall. These events not infrequently transpire with the rapidity of the crisis in lobar pneumonia. More frequently the improvement is gradual. In favorable cases the white-blood-cell count reaches a normal figure about the tenth day of treatment. The temperature usually falls to normal about the fifth day. Occasionally a sharp rise occurs several days later. During early convalescence, as the white-blood-cell count rises, there may develop a variety of suppurative lesions. We believe that the fundamental processes underlying the sequelae were present from the onset, but that the outward and visible signs were manifest only when the bone marrow was able to throw out sufficient numbers of white blood cells to cause the formation of "laudable pus." Certain cases of agranulocytic angina run a fulminating course and death occurs within a day or so of the onset of the disease. No therapy at present available could save these patients. But the apparent degree of illness at the onset is not necessarily an indication of a fatal outcome, and we believe that nucleotide therapy should immediately be instituted and conscientiously pushed irrespective of the patient's apparent condition. After the blood and temperature have become normal, the patients should receive careful convalescent care. Under no circumstances should they return to their usual duties for at least 2 weeks, no matter how well they may feel, and routine blood counts should be done from time to time because of the possibility of relapse. To the pentnucleotide there are, as a rule, no important unfavorable reactions. Rarely reactions are marked. They can usually be prevented by giving divided doses preceded by the local use of novocain. Relapses in agranulocytic angina are not uncommon. They should be treated exactly as the first attack and with the same intensity. The prognosis of the relapse appears to be the same as that of the initial attack. We have demonstrated that in animals there is marked extramedullary myelopoesis following nucleotide therapy within a few days. It is possible that this is the mechanism which brings about recovery in clinical cases. In summary, we may say that both agranulocytic angina and sepsis with extreme leukopenia have a very grave prognosis. The best form of therapy of which we are aware at present is the intramuscular administration of pentnucleotide. The treatment should be persistent and intensive if results are to be obtained.

---

* Presented November 16, 1932.

DISCUSSION

Dr. John Minor: It is a pleasure to welcome a classmate and friend, and a privilege to be asked to open this discussion. Dr. Jackson is a member of the group at Harvard which is doing the most fundamental and important research on diseases of the blood in this country and probably in the world, a group which contains such men as Minot, Castle, Murphy, etc., a group which has been responsible for more real advancement in the understanding and treatment of blood diseases than any other. Unfortunately, although I have spent several weeks in making a rather extensive survey of the literature of agranulocytosis, Dr. Jackson has been so clear and thorough in his presentation that there is really nothing left to be said, and I am certainly not qualified to discuss any aspect of this paper which is based on fundamental research. I have had the opportunity of observing 2 interesting cases of this disease, one of which responded definitely to nucleotide therapy both in the original attack and in the recurrence; the other apparently responded in the original attack but failed to respond later and finally recovered from a very desperate illness with the white blood cells remaining at 300 per cubic millimeter for 10 days, the recovery being clearly not due to specific therapy, since during this period therapy of any sort was not used. It seems to me that at the present time the use of nucleotide offers by far the most rational method of attacking this very grave condition. I am in entire accord with Dr. Jackson as to the use of transfusions; i.e., that they are, if anything, contraindicated.

Dr. Leslie T. Gager: Dr. Jackson's development of nucleotide therapy for agranulocytosis on the basis of empiric observations later supported by experimental studies on its leukocyte-stimulating properties is another illustration of

(*Continued on page 22*)

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D.
C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D.
Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1932–33
President ....Harry A. Fowler. M.D.
1st Vice-President ....Henry R. Schreiber, M.D.
2nd Vice-President............H. Gladys Kain, M.D.
Secretary-Treasurer...........Coursen B. Conklin, M.D

THE ACTION OF DIGITALIS

Next to morphine, digitalis may be said to be the most useful of drugs. One sees, however, so many instances of improper usage and hears at times comments indicating lack of understanding of its action, that a few remarks on this subject may be appropriate. In 1785 William Withering published original observations on the use of foxglove in the treatment of dropsy. He described its therapeutic action and its toxic effects. He apparently thought its main value lay in its diuretic property, but he knew it improved the function of the heart. The rules he propounded for its use are practically those used by good internists today, except that he missed the point of maintaining the state of digitalization. It is known now that the diuretic effect of digitalis is due to the improvement of the circulation resulting from the action of the drug on the heart. Kellum[1] has recently studied this question. Digitalis has three main actions on the heart: (1) It depresses the rate of stimulus production of the sino-auricular node or pacemaker of the heart and also of the auriculoventricular node, so that when the rhythm is normal the heart rate is slowed; (2) it depresses cardiac conductivity, especially of the bundle of His, so that in auricular fibrillation the ventricles respond less often to impulses from the fibrillating auricles; both actions in (1) and (2) are partly due to the paralyzing effect of the drug on the vagus nerves; (3) it acts directly upon the heart muscle, increasing its tone and augmenting the force of contraction. In 1926 Harrison and Leonard[2] startled the medical world by showing that digitalis decreased the minute volume output of the hearts of normal dogs. Thereupon many physicians clamored that these investigators must be wrong because if the cardiac output were decreased when the heart was failing the patient would get worse instead of better. Cohn and Stewart[3] confirmed this observation of the action of digitalis upon the normal dog heart. Dock and Tainter[4] thought they could explain this phenomenon by some action of digitalis on the hepatic veins, whereby these veins contracted and caused a diminution of the amount of blood reaching the heart, a condition which reduced the cardiac output because the inflow was reduced. This may be a factor in dogs, whose hepatic veins have relatively thick, muscular walls, but it can hardly be true in man, in whom these veins are very thin and have practically no musculature. Furthermore the effect upon the hepatic veins of dogs is relatively evanescent, whereas the effect upon the cardiac output lasts for days. Cohn and Stewart[3] showed definitely that this hepatic venous factor was not an important one by testing the effect of digitalis on the heart-lung preparation, in which there were no hepatic veins. The effect upon the output was the same. Cohn and Steele[5] next performed experiments to bring enlightenment regarding the action of the drug. They found that the minute volume output from failing, dilated hearts of dogs in heart-lung preparations is increased when "therapeutic" doses of digitalis are administered, an effect opposite to that in the case of normal hearts. This apparently paradoxical action of digitalis had to be explained. Burwell, Neighbors and Regen[6] had published data in 1928 which suggested that digitalis decreased the cardiac output of normal man, and Stewart[7] later substantiated this finding with the additional data that the size of the heart was at the same time decreased. Stewart[8] showed too that in patients with heart failure the administration of digitalis decreases the size of the heart but increases the cardiac output. In both normal men and cardiac patients the heart rate decreased. The constants, therefore, in both cases were a decrease in size of the heart and a decrease in pulse rate. Recently Stewart and Cohn[9] have demonstrated that in dogs in which auricular fibrillation has been induced with resulting decrease in cardiac output and increase in cardiac size digitalis causes increase in output and decrease in size. Stewart and Cohn[10] then carefully checked the effect of digitalis on the hearts of normal human beings and patients with chronic heart failure and drew the following conclusions. "Digitalis, we think, has similar, perhaps identical, actions both in normal and in diseased hearts; it *decreases* cardiac size and *increases* the extent of ventricular contraction. The consequence of these actions is that the volume of the cardiac output which results differs, depending on an initial difference in size of the ventricular cavities, in the two situations. In the one, the normal heart, it becomes too small; in the other, the diseased heart, it develops a suitable size." Thus the apparent paradoxical action of digitalis is satisfactorily explained by the fact that by increasing the tone of the myocardium a decrease in size results, which in the dilated heart means a greater output but in the normal heart brings about a diminished output.

---

[1] Kellum, E. L.: The Diuretic Effect of Digitalis. Am. Heart J., 1932, **7**, 342.

[2] Harrison, T. R., and Leonard, B. W.: The Effect of Digitalis on the Cardiac Output of Dogs and Its Bearing on the Action of the Drug in Heart Disease. J. Clin. Invest., 1926, **3**, 1.

[3] Cohn, A. E., and Stewart, H. J.: The Relation between Cardiac Size and Cardiac Output per Minute Following the Administration of Digitalis in Normal Dogs. J. Clin. Invest., 1928, **6**, 53.

[4] Dock, W., and Tainter, M. L.: The Circulatory Changes after Full Therapeutic Doses of Digitalis with a Critical Discussion of Views on Cardiac Output. J. Clin. Invest., 1930, **8**, 467.

TRANSACTIONS OF THE SOCIETY

Stated Meeting, January 4, 1933

The following were duly elected to membership:

Active Members

Robert Meston Bolton, 1835 Eye Street, N.W.
Roger Morrison Choisser, 3500 Thirty-sixth Street, N.W.
Roger Stahel Cohen, 1726 Eye Street, N.W.
Edwin Stanton Crisp, 329 East Capitol Street
Samuel Mayer Dodek, 1835 Eye Street, N.W.
Richard Edgar Dunkley, 1801 Eye Street, N.W.
Samuel Luber, 1801 Eye Street, N.W.
John Galloway Lynn, 1801 Eye Street, N.W.
Claudius Frank Mayer, 5513 Thirty-ninth Street, N.W.
William Carey Meloy, 2019 R Street, N.W. (Formerly an Associate Member)
Marion Thomas Rosser, 1726 Eye Street, N.W.
Alma Jane Speer, 3225 Garfield Street, N.W.
Charles Paul Waite, 1601 Argonne Place, N.W.

Associate Members

Valcoulon LeMoyne Ellicott, Bethesda, Maryland.
Chester R. Smith, (D.D.S.) 1801 Eye street, N.W.

Applicants for membership to be voted on in March, 1933:

For Active Membership

MacPherson Crichton, Hahnemann Medical College—1898
William Parker Herbst, Jr., Georgetown University—1915
Frank Stephen Horvath, Royal Hungarian University—1915
Richard V. Mattingly, George Washington University—1931

---

[5] Cohn, A. E., and Steele, M. J.: Studies on the Effect of the Action of Digitalis on the Output of Blood from the Heart: *I*. The Effect on the Output of the Dog's Heart in Heart-Lung Preparations. J. Clin. Invest., 1932, **11**, 871.

[6] Burwell, C. S., Neighbors, D. W., and Regen, E. M.: Effect of Digitalis Upon Output of Heart in Normal Man. J. Clin. Invest., 1927, **5**, 125.

[7] Stewart, H. J.: Effect of Giving Digitalis on the Volume Output of the Heart and Its Size in Normal Individuals. Proc. Soc. Exper. Biol. & Med., 1931, **29**, 207.

[8] Stewart, H. J.: Effect of Giving Digitalis on the Volume Output of the Heart and Its Size in Heart Failure. Proc. Soc. Exper. Biol. & Med., 1931, **29**, 209.

[9] Stewart, H. J., and Cohn, A. E.: Studies on the Effect of the Action of Digitalis on the Output of Blood from the Heart: *II*. The Effect on the Output of the Hearts of Dogs Subject to Artificial Auricular Fibrillation. J. Clin. Invest., 1932, **11**, 897.

[10] Stewart, H. J., and Cohn, A. E.: Studies on the Effect of the Action of Digitalis on the Output of Blood from the Heart: *III*. Part 1. The Effect on the Output in Normal Hearts. Part 2. The Effect on the Output of Hearts in Heart Failure with Congestion, in Human Beings. J. Clin. Invest., 1932, **11**, 917.

For Associate Membership

Benjamin Karpman, University of Minnesota—1920

Changes in membership:

Status changed from Active to Associate Membership:
Walter G. Eisinger, Jr.
Russel J. Jansen
Clifton R. Wallace

Resigned from Active Membership:
William C. Rives

Resigned from Associate Membership:
Roy T. Morris

The President was empowered to appoint a special committee for the accumulation of data and for subsequent appearance, if deemed proper, before the Shannon Committee now investigating the competition of the Government with private business. The power of this committee was enlarged to include investigation of the relationship of the general profession to the operation of the Workman's Compensation Act. There has been expression of dissatisfaction by practitioners concerning activities of certain "Insurance Clinics" and physicians employed by Insurance Companies. It would be well for every one interested to lend assistance to the committee in gathering data and ultimate solution of problems affecting the physician's economics.

Personnel of the committee appointed:

James A. Flynn, Chairman
Francis X. McGovern
Joseph S. Wall
James A. Cahill, Jr.
R. Arthur Hooe
Joseph Horgan

Amendment to the By-laws adopted:

Article VIII, Section 2, was amended so as to read as follows: "In certificates of illness concerning absence from official duties given to employees in the public service, or others, the disease shall not be specified, neither shall the name or nature of the disease be divulged by any written description or statement of symptoms, given to the patient, nor by any specification of the disorder, nor by any disclosure which may be construed as an evasion of the purpose of this regulation, *except upon the written request of the patient or in the event of being required by law.*"

Proposed amendments to be voted on in March, 1933:

1. In Article VII, Section 3, of the Constitution, strike out the words "respective committees" and insert the word "President." Section 3 would then read: "The Committee of Censors, Committee on Publication, Committee on Public Information, House Committee, and Committee on Civic Health, shall consist of five members each, and shall be appointed by the President at the time of his assumption of office, to serve until their successors are appointed. Vacancies shall be filled as they occur by appointment by the President. The Chairmen of these committees shall be designated by the *President*, and shall be ex officio members of the Executive Committee."

2. In Article XI, Medical Defense By-Law, the following changes are suggested:

(a) In Section 6, in the fourth line after the word "assistance" add the words "except financial." Section 6 would then read—"If a member applying to the Medical Defense Committee for assistance is protected by an insurance policy indemnifying him against loss by reason of malpractice, the committee shall lend such assistance, *except financial*, as in its judgment is advisable."

(b) In Section 10, strike out the third sentence and substitute the following: "Without such written agreement the Medical Defense Committee shall render only such assistance as provided in Section 6."

(c) In Section 11, add after the word "advice," the words "and consent," so as to read—"The Medical Defense Committee with the advice *and consent* of the Executive Committee, shall obtain the services of competent counsel as occasion requires, to advise,........"

3. Change Article V, Section 1, of the Constitution to read as follows: "The members of this Society shall be of four classes, active, associate, honorary, and members by invitation."

Add Section 15 to Article V, to read as follows: "The Surgeons General of the United States Army, Navy and Public Health Service, upon nomination by the Committee of Censors, and by approval of the Society, may become members by invitation during their term of active service as Surgeons General without payment of dues and assessments."

FORTY YEARS OF MEMBERSHIP

Pursuant to Article V, Section 10, of the Constitution, "members of the Society who have had forty years of continuous active membership shall be absolved from the payment of any further dues or assessments." The following are included in this group as of January 1, 1933:

Seniority Number		*Date of Membership*
124	James Henry Morgan Barber	April 7, 1892
126	John Van Rensselaer	April 9, 1892
127	George Campbell Clark	April 12, 1892
135	Wade H. Atkinson	October 22, 1892
137	John W. Chappell	November 9, 1892

These members have attained honorable mention. Their names are added to those who not only have contributed almost a half century of effort in furthering the cause of organized medicine, but who have rendered distinguished service to the community. Members absolved from further payment of dues because of forty years of continuous active membership now number 30.

HONORARY MEDICAL SOCIETY

George Washington University School of Medicine

The School of Medicine of the George Washington University has created through its faculty and student body, an honorary medical society to be known as the Smith-Reed-Russell Society in honor of Dr. Theobald Smith, Dr. Walter Reed and General Frederick F. Russell. These three scientists were all at one time members of the faculty of the school and their names are known internationally for their contributions to medical science. Students having a general average of 86 or better in all of their work in the School of Medicine, of the second, third and fourth year classes, are eligible for membership and the key of the society.

At the December 17th meeting Professor Edwin O. Jordan of the Department of Hygiene and Bacteriology, University of Chicago, presented a paper which included a summary of his work on "The Common Cold and Influenza."

On January 13, members of the Smith-Reed-Russell Society met at the University Club for the first annual banquet on which occasion members of the faculty and student members of the society had as guests Dr. Theobald Smith and General Frederick F. Russell, the two surviving scientists of the three after whom the society is named. An interesting event was the acceptance of the key of the society by Colonel Albert E. Truby for Colonel Walter Reed, Jr., in honor of his father. The work of Walter Reed on yellow fever is well known. Dr. Smith's outstanding work on tuberculosis, on Texas cattle fever and many other phases of bacteriology were epoch making. Dr. Smith discovered killed germs may be used for vaccines in the prevention of disease. General Russell's later application of this knowledge on a large scale in establishing the value of typhoid vaccination saved many lives and no doubt millions of dollars in pensions for the United States Government and other governments in the world. Dr. Smith recently retired as Director of the Rockefeller Institute at Princeton. General Russell is now Director of the International Health Division of the Rockefeller Foundation in New York and, under his direction, during the past few years the recent advances in the study of yellow fever have been made confirming wholly the work of Reed and his group in Panama over 3 decades ago.

Among those present at the banquet besides the student members and their president, Mr. James L. Snyder, were Dr. Cloyd H. Marvin, President of the University and several Emeritus Professors of the school including Drs. Sterling Ruffin, D. Kerfoot Shute and William K. Butler and active members of the faculty including Drs. Earl B. McKinley, Dean of the School of Medicine, Leland W. Parr, George B. Jenkins, Errett C. Albritton, Walter A. Bloedorn, Vincent du Vigneaud, Walter Freeman, Roger M. Choisser, George B. Roth, Francis R. Hagner, William J. Mallory, Charles A. Simpson, Howard F. Kane, Radford Brown, Harry H. Donnally, Charles S. White, William B. Mason, Daniel LeRay Borden, Roscoe R. Spencer, Harry F. Anderson, Frank A. Hornaday, William A. White, Nolan D. C. Lewis, John A. Reed and Colonel Thomas D. Woodson.

GEORGETOWN UNIVERSITY MEDICAL ALUMNI SOCIETY

The Georgetown University Medical Alumni Society will meet at the Medical School Building, 3900 Reservoir Road, Thursday, January 26. Dr. Wells P. Eagleton, Chief of the Division of Cranial Surgery, Newark, N. J., City Hospital, will address the meeting on the subject, "The Surgical Treatment of Osteomyelitis of the Skull in Relation to Meningitis."

SEVENTEENTH ANNUAL CLINICAL SESSION OF THE AMERICAN COLLEGE OF PHYSICIANS

The seventeenth annual clinical session of the American College of Physicians will be held in Montreal, Canada, February 6 to 10, 1933.

A very interesting program has been arranged, with clinics at the various hospitals in the forenoons and general scientific sessions in the afternoons. Dr. George Morris Piersol, of Philadelphia, will be inducted into office as the new president of the College. Dr. Wm. Gerry Morgan, a past president of this Society and also of the American Medical Association, is secretary-general of the College.

Papers will be read by members of this Society as follows: Drs. Wallace M. Yater and Laurence S. Otell, "The Differential Diagnosis of Diseases of the Liver and Spleen by the Aid of Roentgenography after the Intravenous Injection of Thorium Dioxide Sol," Wednesday afternoon, February 8. Dr. Walter Freeman, "A Study of the Correlations Between Physical Aspects of the Body and Disease Susceptibility," on Thursday afternoon, February 9.

Montreal is a wonderful city for a convention. It is unusually interesting historically and medically. It is the second largest French speaking city in the world, the fifth largest city in North America, and the second largest seaport on the Continent. In the latter connection it is unique in that it lies one thousand miles inland. A visit to this city and attendance at the meetings would be of great value to members of the Society.

REPRINTS

"Sensitization to Fungi," Annals of Internal Medicine, November, 1932, by Grafton Tyler Brown, M.D.

"Laryngeal Tuberculosis. Some Experiences and Observations," Archives of Otolaryngology, September, 1932, by Richard Wallace Wilkinson, M.D.

"Treatment of Some of the Commoner Lid Conditions," Southern Medical Journal, March, 1932, by Oscar Wilkinson, M.D.

"A Simple Method of Suprapubic Cystostomy," American Journal of Surgery, December, 1932, by Norvell Belt, M.D.

"The Mechanism of Adjustment of the Circulation in Hyperthyroidism (Thyrotoxicosis)," American Heart Journal, October, 1932, by Wallace M. Yater, M.D.

"The Treatment of Essential Hypertension by X-Radiation of the Medulla Oblongata," Southern Medical Journal, July, 1932, by Wallace M. Yater, M.D., Fred O. Coe, M.D., and Isadore Rodis, M.D.

"Response of Explanted Cardiac Muscle to Thyroxine," American Journal of Physiology, March, 1932, by Cecile Markowitz, M.D., and Wallace M. Yater, M.D.

ABSTRACT OF PAPER READ BEFORE THE SOCIETY

(*Continued from page 17*)

Pasteur's axiom that chance favors the man who is prepared. More or less close observation of several patients has convinced me that diminution or disappearance of granulocytes from the blood stream precedes the appearance of angina and the other phenomena of sepsis. In other words, loss of the phagocytes leaves the tissues with lowered defences against bacterial invasion. In the case of one woman, which Dr. Speer and I reported in the American Journal of Roentgenology and Radium Therapy for January, 1932, this sequence of events was seen on several occasions. Dr. Leffler was making daily leukocyte counts and for 2 days while the neutrophils were dropping almost to the vanishing point this girl maintained her physical and mental well-being. Overnight she became weak and desperately ill, and with total lack of granulocytes she developed sore throat and ulceration of one tonsil and of the vulva. This was before Dr. Jackson had reported the use of the nucleotides and we turned to roentgen radiation for help. The response to irradiation of the long bones was immediate and striking, with sharp rise in granulocytes and equally prompt disappearance of fever and infection. Such crises were controlled or aborted 4 times in this patient and once in another: both left the hospital in good condition. Rather than dismiss X-ray treatment as "black magic," I should prefer to believe, as Doan suggests, that irradiation in proper dosage may by catalysis or cell destruction give rise to nucleotides. I am entirely willing to accept the superior merits of direct nucleotide therapy and I feel that our Society is greatly indebted to Dr. Jackson for this exposition.

Further discussion participated in by **Drs. Walter A. Bloedorn, A. J. B. Connolly, E. Clarence Rice, W. Cabell Moore, H. H. Leffler, Walter Freeman and F. A. Hornaday.**

CONTAGIOUS DISEASE REPORT
OCTOBER, 1932

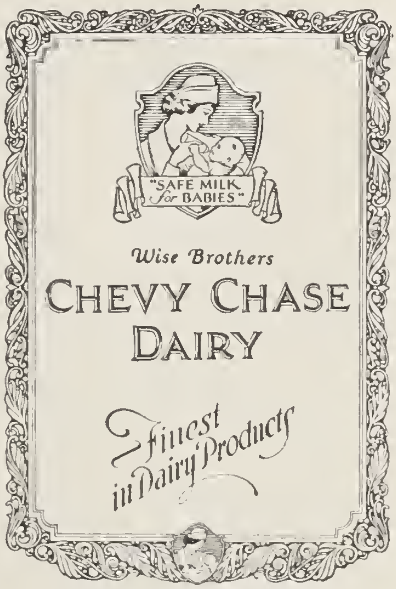
Health Department, District of Columbia

	Morbidity	*Mortality*
Diphtheria	18	0
Scarlet Fever	54	0
Measles	5	0
Whooping Cough	25	0
Chicken Pox	9	0
Typhoid Fever	3	0
Poliomyelitis	10	1
Epidemic Cerebro-Spinal Meningitis	0	0
Smallpox	0	0
Influenza	5	2
Pneumonia (all forms)	66	40
Pellagra	1	1
Encephalitis Lethargica	0	0
Typhus Fever	1	0
Syphilis	351	11
Gonorrhea	233	0
Chancroid	11	0
Tuberculosis (all forms)	77	40

CONTAGIOUS DISEASE REPORT
NOVEMBER, 1932

Health Department, District of Columbia

	Morbidity	*Mortality*
Diphtheria	32	2
Scarlet Fever	55	0
Measles	4	0
Whooping Cough	29	0
Chicken Pox	72	0
Typhoid Fever	9	1
Poliomyelitis	2	0
Epidemic Cerebro-Spinal Meningitis	1	0
Smallpox	0	0
Influenza	12	6
Pneumonia (all forms)	92	44
Pellagra	0	0
Encephalitis Lethargica	0	0
Typhus Fever	2	0
Syphilis	378	9
Gonorrhea	223	0
Chancroid	5	0
Tuberculosis (all forms)	95	39



"SAFE MILK for BABIES"

Wise Brothers

CHEVY CHASE
DAIRY

Finest in Dairy Products

'Phone WEST 0183

**MERCUROCHROME-
220 SOLUBLE**

in

OBSTETRICS

A statistical study of a series of over 9000 cases showed a morbidity reduction of over 50% when Mercurochrome was used for routine preparation.

Write for information

Hynson, Westcott & Dunning, Inc.
BALTIMORE, MARYLAND

L. A. CULTURE

A concentrated peptonized whey culture of the lactobacillus acidophilus.

FOR CHANGING THE FLORA OF THE INTESTINES.

With each 8-oz. bottle of the Culture we include a box of Lactose or L. A. Formula.

L. A. FORMULA

Lactose - 4 parts
Dextrin - 1 part
Psyllium Seed
Concentrate - 3 parts

NATIONAL VACCINE AND ANTITOXIN INSTITUTE
1515 U Street, N. W., Washington, D. C.
Phone: North 0089

VITAMIN CONCENTRATE OF COD LIVER OIL

In standardizing McKesson's Vitamin Products best results have been produced through careful study at a given dosage level. Administering Vitamins in excess of the dosage level established does not produce beneficial effects in proportion to the quantity administered, but there is only efficiency in proportion to the amount absorbed. Therefore, it avails us nothing and may even produce deleterious results, to administer mass doses of Vitamins in the hope of effecting more rapid recovery than might ordinarily be expected. (Note: See editorial in Journal of American Medical Association, September 24, 1932, on "Hypervitaminosis.") McKesson's Vitamin Concentrate of Cod Liver Oil is supplied in the strength of 11 A and 11 D, suspended in a neutral oil to preserve the Vitamins against oxidation. It is flavored slightly to render it more palatable, and in its administration minims from a specially designed dropper are substituted for teaspoonfuls. The present United States Pharmacopeia X states that Cod Liver Oil to meet the requirements of this edition must contain not less than 50 units of Vitamin A per gram. Were we to base our claims for potency on the U. S. P. X. we could state that our Concentrate is 110 A, as each gram contains not less than 5,500 units of Vitamin A. *The doctor having determined the dosage level in teaspoonfuls, required for his patient on the basis of high potency oil, will need only to transpose this dosage level into the proper number of minims, thus simplifying the question.*

The Veil Maternity Hospital
West Chester, Pennsylvania

Absolute privacy and special ethical treatment. Patients accepted at any time during gestation. Open to Regular Practitioners. Early entrance advisable.

CONFINEMENT
NURSERY
SECLUSION
ADOPTION
The VEIL
MATERNITY HOSPITALS

For care and Protection of
THE BETTER CLASS UNFORTUNATE YOUNG WOMEN

Adoption of Babies when Arranged For. Rates Reasonable.

Located on the Interurban and Pennsylvania Railroad.
Twenty miles from Philadelphia, Pa.

Write for Booklet

THE VEIL
WEST CHESTER, PENNSYLVANIA

THE GIBSON COMPANY

Washington's Oldest Surgical, Medical, Drug and Scientific Supply House.

Everything for The Physician, The Nurse and The Invalid.

At the Right Price

917 G Street, N. W.
Washington, D. C.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II FEBRUARY, 1933 NUMBER 2

SIMPLIFIED DIETS FOR DIABETIC PATIENTS

FRANK N. ALLAN, M.D.
Division of Medicine, The Lahey Clinic, Boston, Mass.
AND
SISTER MARY VICTOR, B.S.
St. Mary's Hospital, Rochester, Minnesota

The need for thorough treatment of diabetes is emphasized by every authority to such an extent that dieting has been made to appear unnecessarily complex. The difficulties of dieting are frequently over-emphasized in statements such as these:

> "It is therefore essential that the patient should acquaint himself with the elementary facts of dietary laws, the calorie value of common foods, and what is more important, the carbohydrate, fat and protein content of the food that he eats." This is a quotation from a popular article on diabetes published in a medical journal for the laity.
>
> "Diabetes is a disease, the successful treatment of which necessitates the intelligent coöperation of the patient. It is not merely a question of taking prescribed medication, and following general dietetic directions, but of understanding the composition of foods, food values, and food utilization. The success or failure of treatment depends on the realization of this and the willingness of the patient to learn and apply the knowledge." This is a quotation from the foreword of one of the numerous books for diabetic patients.

Were these statements true, only a few of the persons afflicted with diabetes could hope to have successful treatment. Few physicians are in a position to give their patients such extensive instruction and the patient, after receiving such education in the fundamentals, may still fail to make practical use of it from day to day unless he possesses unusual interest. In fact, such elaborate instruction is unnecessary; patients with even severe diabetes can be shown how to carry on effective dietary treatment in a much simpler way and even if the statements quoted were true, in regard to the needs of patients with severe diabetes, they could not apply to the cases of mild diabetes which form such a large percentage of the total number of sufferers from the disease.

A diabetic patient may have accurate dietary treatment without learning anything about the composition of the food he eats, and he may be safe with complete ignorance of the terms calories, carbohydrates and metabolism. The truth of this has been shown by experience at The Mayo Clinic. Efforts have been made to simplify dietary treatment, and during the last three years much simpler procedures have been employed in the planning of diets and instruction of patients. The results have been satisfactory from every standpoint. The patients have been spared laborious study of theoretic matter of little practical value. The treatment has been made easier and the time required for instruction has been reduced.

METHODS OF TREATMENT

The aim of treatment of diabetes is to restore the patient to physical and mental vigor and to maintain him in health. There are three criteria of successful treatment. First and most important is that the patient feels well and contented. Second, the patient should receive sufficient nourishment to provide for normal activity and to maintain his weight at the optimal level. Third, the urine should be kept free from sugar. Whether insulin is used or not, attention to diet is needed to meet these requirements.

The treatment required depends on the severity of the disease and also on the age of the patient. A young patient should receive the most careful attention even when the disease seems mild, since in such cases the diabetes is almost always potentially severe. Elderly patients with mild diabetes can be treated in quite different fashion. In consideration of treatment for diabetes little attention has been given to mild diabetes, for interest has been focused on severe cases. In the mild cases, which are so numerous and frequently neglected, the need for treatment may not be appreciated either by the patient or by his physician. Yet it is important to control even mild diabetes to prevent impairment of health eventually, and to guard against the complications which tend to develop. Although under-treatment is common, a few patients suffer from over-treatment. An elderly patient may be subjected to needless trouble and anxiety if given the strict regimen required for a severely ill patient. The end-result is often complete neglect, for such a patient may come to think that elaborate dietary procedures are beyond his needs, and will then abandon treatment entirely.

The patient with mild diabetes requires only simple dietary treatment, but the advice regarding it must be accurate. A patient who is told merely to be "careful" about sugars and starches, may eat an amount of food which is far from satisfactory. Some patients, because of panic and anxiety, may take for a time an amount of nourishment which is grossly inadequate. Other patients who think they are dieting strictly may actually take an enormous amount of nourishment. Two examples are given to show how unsatisfactory the diet may be.

The first case was that of a middle-aged Italian who operated a fruit store. He followed the advice to avoid sugar and starches by giving up bread and macaroni, but he consumed so much fruit that his carbohydrate intake remained high. He ate a large quantity of meat, since this was not restricted, consequently the calorie value of his food was far beyond his needs. Yet he remained hungry and dissatisfied and the diabetes was unchecked. His average daily food intake is shown in Table 1.

The second case was that of a boy aged fourteen years, who had had mild diabetes since February, 1931. He was given the usual advice regarding avoidance of sugar and starches. He got along well at first since the diabetes was unusually mild, but several months later it became impossible to control glycosuria. A study of the food intake for a typical day shows the reason clearly. Although the boy was following the dietary advice "strictly," he was eating approximately 5,500 calories. He had the hearty appetite of the rapidly growing school boy, and naturally ate a large amount of the foods which were "safe" according to the rules given him. Among other things he ate freely of gluten bread. A half pound of cheese and numerous peanuts were consumed to overcome the hunger that

TABLE 1

"QUALITATIVE" DIET PRESCRIBED FOR A PATIENT WITH DIABETES, EXAMPLE OF POOR SELECTION OF FOOD

	GM.*	
Carbohydrate	241	
Protein	156	
Fat	223	
Calories		3,595
Food:		
Vegetables, 5 per cent	200	
Vegetables, 10 per cent	200	
Apples	200	
Grapes	600	
Cereal	14	
Butter	90	
Meat	400	
Cream, ½ pint		
Milk, 1 quart		

* Weight of foods estimated.

TABLE 2

DIETS PRESCRIBED FOR SCHOOL BOY

UNSATISFACTORY DIET*			SATISFACTORY DIET		
	Gm.			*Gm.*	
Carbohydrate	164		Carbohydrate	80	
Protein	264		Protein	75	
Fat	428		Fat	258	
Calories		5,564	Calories		3,032
Vegetables, 5 per cent	200		Vegetables, 5 per cent	600	
Vegetables, 10 per cent	200		Vegetables, 10 per cent	100	
Fruit, 10 per cent	50		Fruit, 5 per cent	200	
Gluten bread	180		Fruit, 10 per cent	100	
Butter	80		Soy bean muffins		3
Cream, 20 per cent	65		Cereal	20	
Milk	600		Butter	70	
Bacon	60		Mayonnaise	55	
Eggs		4	Cream, 40 per cent	230	
Meat	100		Milk	300	
Cheese	240		Bacon	25	
Peanuts	300		Eggs		2
			Meat	100	

* Weight of food estimated.

remained after taking three large meals. All these foods had been permitted without limitation. The diet (the quantity of foods estimated) is shown in Table 2, along with the diet which was prescribed in November, 1931.

The latter is high in calories since the boy was above the average size (height, 5 feet, 9 inches; weight, 122 pounds), was growing rapidly, and led an active life. He was able to utilize this diet with a small amount of insulin, 3 units twice daily. The blood sugar became normal. He improved in health and gradually gained weight. Small changes have since been made in the diet and insulin dosage. He is now in excellent condition.

Rules For Patients With Mild Diabetes

The following rules are a satisfactory guide for the majority of elderly patients with mild diabetes. They show not only the foods which must be avoided, but the foods which should be used.

1. Do not use sugar, or any food made with sugar such as candy, jelly, marmalade, syrup, molasses and honey. You may use saccharine if desired for sweetening.
2. Do not use cake, pie, puddings, waffles, soft drinks, ice cream or similar foods rich in starch or sugar.
3. You may use one small slice of bread with each meal. Gluten bread, graham bread, brown bread, rye bread and corn bread may contain as much sugar-forming material as white bread, and cannot be used any more safely.
4. You may use one of these foods each day if the amount is small: bananas, apples, plums, pears, cherries, raspberries, grapes, corn, peas, parsnips, shelled beans, potatoes, cereal, macaroni, rice.
5. You may use a small amount of fresh fruit, or fruit canned without sugar, each meal. The fruits mentioned in section 4 must be used with caution. Do not use dried fruit or fruit preserved with sugar.
6. You may use vegetables, except those mentioned in section 4, in liberal quantities. You may use one serving of carrots, beets, turnips, rutabagas, squash or onions each day. You may use two or three servings of other vegetables such as lettuce, tomatoes, string beans, spinach or celery with each meal.
7. You may use meat and eggs in moderation. For breakfast you may have bacon with one egg; for dinner and supper, a small serving of meat or fish or two eggs.
8. You may use one glass of milk each day.
9. You may use cream, a half pint each day unless you are overweight.
10. You may use fats, including butter, oleomargarine, bacon fat, mayonnaise, olive oil, or other salad oil in an amount sufficient to keep your weight normal. Loss of weight may be prevented by eating more fat; gain in weight can be avoided by eating less fat.
11. You may drink a cup of coffee or tea with each meal. Sweeten with saccharine if desired.
12. You may use condiments such as salt, pepper, spices and vinegar in reasonable amounts.
13. The regular test of the urine for sugar will serve as your guide in dieting. If sugar appears in the urine, foods in section 4 must be omitted entirely, and the allowance of bread reduced. If sugar is still present, report to your physician; an exact diet plan must be prescribed and the quantity of foods measured accurately.

Most patients need an outline of the meals which may be eaten in accordance with these rules. The sample menu which follows serves as an example. The quantities of bread and butter must be written in and the diet can be readily modified by alteration in the quantities of these and other foods to suit the needs of different patients. The amount of nourishment taken in accordance with these instructions varies, depending on the patient's estimate of the size of proper portions. The carbohydrate may be from 100 to 150 gm., protein from 50 to 75 gm., and fat from 100 to 250 gm.

SAMPLE MENU

Breakfast: Orange, cereal, cream, bacon, egg, toast (one slice), butter (one or two squares), coffee with cream.

Dinner and supper: Broth, vegetable salad, oil dressing, vegetables, two or three servings (see section 6), meat, bread, (one slice), butter (two or three squares), fruit (see section 5), tea or coffee, with cream.

Milk, one glass with one meal; cream one-half pint divided among the three meals.

The results of treatment with this diet plan must be carefully followed. If the patient loses weight, he should be advised to use more fat, if he gains too much weight, he should limit the fat food. If he continues to have glycosuria, more exact dieting must be instituted. If he becomes tired of dieting his interest may be maintained by introducing more variety in the menu. The assistance of an experienced dietitian is then invaluable. The need for continuous supervision deserves emphasis. It is important both to maintain control of the disease and to keep the patient contented.

Diets For Patients Who Require Exact Dieting

If the patient has severe diabetes, or if he is aged less than thirty years, accurate dietary treatment must be employed at the start. The procedure employed at The Mayo Clinic is as follows:

TABLE 3

Standard Diets for Diabetic Subjects

	A SERIES			B SERIES			C SERIES		
Adults	1	2	3	1	2	3	1	2	3
Diet Calories	1,300–1,800	1,800–2,300	2,300–2,900	1,300–1,800	1,800–2,300	2,300–2,900	1,300–1,800	1,800–2,400	2,400–3,000
	gm.	*gm.*	*gm.*	*gm.*	*gm.*	*gm.*	*gm.*	*gm.*	*gm.*
Food:									
Vegetables 5 per cent	400	400	400	400	400	400	400	400	400
Vegetables 10 per cent	100	100	200	100	100	200		100	200
Fruit 5 per cent	200	200	200	200	200	200			
Fruit 10 per cent	100	100	100	100	100	100	300	300	300
Vegetables and fruits 20 per cent							100	100	100
Cereal (dry weight)			14		14	28	14	14	28
Bread	20	20		60	60	60	60	60	60
Soy bean muffins	2	2	3						
Cream 20 per cent	100	230		100	230		100	230	
Cream 40 per cent			230			230			230
Milk	200	200	200	200	200	200	200	200	200
Bacon	25	25	25	25	25	25	25	25	25
Eggs	1	1		1			1		
Meat (lean)	50	50	100	50	100	100	50	100	150
Butter and mayonnaise	Amount depends on calories required								

	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER
		gm.		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*
Butter and mayonnaise of equal food value may be used interchangeably	1,261	20	1,764	50	2,290	40	1,253	30	1,769	50	2,316	60	1,331	20	1,797	40	2,406	40
	1,342	30	1,845	60	2,362	50	1,325	40	1,850	60	2,397	70	1,412	30	1,869	50	2,478	50
	1,414	40	1,926	70	2,443	60	1,397	50	1,930	70	2,469	80	1,484	40	1,950	60	2,559	60
	1,486	50	1,998	80	2,524	70	1,478	60	2,003	80	2,541	90	1,556	50	2,031	70	2,640	70
	1,567	60	2,070	90	2,596	80	1,550	70	2,075	90	2,622	100	1,637	60	2,103	80	2,712	80
	1,648	70	2,151	100	2,668	90	1,622	80	2,156	100	2,703	110	1,718	70	2,175	90	2,784	90
	1,720	80	2,223	110	2,749	100	1,694	90	2,228	110	2,775	120	1,790	80	2,251	100	2,865	100
	1,792	90	2,304	120	2,821	110	1,784	100	2,309	120	2,847	130	1,862	90	2,332	110	2,946	110
Carbohydrate, gm.	66		73		75		85		103		115		120		133		145	
Protein, gm.	49		53		60		46		58		59		48		60		74	
Fat	*$\frac{M-460}{9}$		$\frac{M-504}{9}$		$\frac{M-540}{9}$		$\frac{M-524}{9}$		$\frac{M-644}{9}$		$\frac{M-696}{9}$		$\frac{M-672}{9}$		$\frac{M-772}{9}$		$\frac{M-876}{9}$	

* Number of grams of fat may be calculated by subtracting the figure shown from M (the number of calories) and dividing by 9.

The first step is to estimate the calorie requirement. The basal expenditure of calories is determined from the nomographic chart of Boothby and Sandiford. One can also make a rough estimate by multiplying the patient's weight in pounds by 10 (weight in kilograms by 22) increasing this figure for patients who are young or tall, decreasing it for patients who are elderly or short. It is usually satisfactory to provide, for a patient who is at rest in bed, a diet with 10 per cent above the basal calories, for a person with ordinary light activity, 30 per cent above the basal calories and for a person who is doing fairly hard work, 50 per cent. If the patient has been very much under-weight, or if he is obliged to do unusually hard work, still more nourishment may be required. If enough food is given it should be unnecessary to limit the patient's activities. For patients who are over-weight, diets low in calories are prescribed, for the control of diabetes is usually easier if obesity is overcome. For the ordinary individual it is best to hold the weight a little under the average.

The next step is to select the standard diet which will provide the patient with the required amount of nourishment. The standard diets are shown in Table 3. The A series is used when strict dieting will control diabetes without insulin, and also at the beginning of treatment for patients who require insulin, unless the circumstances and appetite of the patient make it necessary to use a more liberal allowance of carbohydrate food from the start. The B series is used for patients with milder diabetes and for patients requiring insulin who need or wish to have more carbohydrate food. The C series is used for patients who, having tried the A and B types of diet, prefer to have more carbohydrate

TABLE 4

STANDARD DIETS FOR CHILDREN

AGE, YEARS	3–4		5–6		7–8		9–11		12–15					
CALORIES	900–1,200		1,000–1,350		1,100–1,550		1,300–1,850		1,500–1,800		1,800–2,300		2,300–2,800	
	gm.		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*	
Food:														
Vegetables 5 per cent	200		300		400		400		400		400		400	
Vegetables 10 per cent							50		100		100		200	
Fruit 5 per cent	200		200		200		200		200		200		200	
Fruit 10 per cent	50		50		100		100		100		100		100	
Cereal (dry weight)													14	
Bread	30		30		10		20		20		20			
Soy bean muffins					2		2		2		2		3	
Cream 20 per cent							100		100		230			
Cream 40 per cent													230	
Milk	500		500		500		400		400		300		300	
Bacon					15		15		25		25		25	
Eggs	2		2		1		1		1				1	
Meat (lean)	25		25		25		50		50		100		100	
Butter and mayonnaise	Amount depends on calories required													
Cod liver oil	2 teaspoonfuls daily from October to April during first six years. When used deduct 10 grams from regular allowance of butter													
	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER	CALORIES	BUTTER
		gm.		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*		*gm.*
Butter and mayonnaise of equal food value may be used interchangeably	894	20	991	30	1,093	20	1,537	20	1,496	30	1,797	40	2,301	30
	975	30	1,063	40	1,174	30	1,418	30	1,568	40	1,869	50	2,373	40
	1,047	40	1,135	50	1,246	40	1,490	40	1,640	50	1,950	60	2,445	50
	1,119	50	1,216	60	1,328	50	1,562	50	1,721	60	2,031	70	2,526	60
	1,200	60	1,297	70	1,409	60	1,643	60	1,802	70	2,103	80	2,607	70
			1,369	80	1,490	70	1,724	70			2,175	90	2,679	80
					1,562	80	1,796	80			2,266	100	2,757	90
							1,868	90					2,832	100
Carbohydrate, gm	62		65		64		73		76		78		80	
Protein, gm	40		41		45		52		55		63		70	
Fat, gm	*$\frac{M-408}{9}$		$\frac{M-424}{9}$		$\frac{M-436}{9}$		$\frac{M-500}{9}$		$\frac{M-524}{9}$		$\frac{M-564}{9}$		$\frac{M-600}{9}$	

* Number of grams of fat may be calculated by subtracting the figure shown from M (the number of calories) and dividing by 9.

food and are willing to use the larger amount of insulin required. The diet selected in each series depends on the calorie requirement. When it is below 1800 the number 1 diet is used; when in the middle range the number 2 diet, and when above 2300 or 2400 the number 3 diet is used.

These ready-made diets are suitable for the majority of cases, and it simplifies the beginning of treatment to use them. They contain an adequate supply of vitamins and minerals. The amount of food is usually sufficient to satisfy the appetite, and the calorie value is flexible. They can be readily modified by additions or substitutions to suit the needs of any case. For example, if the patient is a large man, the amount of protein is increased to give approximately 4 gm. for each 10 pounds of weight (almost 1 gm. for each kg.). The day's allowance of food is shown in the table, the amount of everything to be used being listed except the butter and mayonnaise. The amount of the latter depends on the number of calories to be provided. This is indicated in the lower part of the table. Butter, and mayonnaise made according to the recipe given later, have equal food value and may be used interchangeably.

The articles of food employed are those used in the average household with two exceptions, fruit canned without sugar and muffins made from soy bean flour and bran. The latter are a palatable and inexpensive substitute for bread, and are useful when diets low in carbohydrate are desired. Special diabetic foods are best avoided, since they cannot be included in the diet without special planning. Furthermore, they are relatively expensive and add unnecessarily to the cost of treatment.

The standard diets for children, shown in Table 4, are relatively low in carbohydrate and correspond to the A series of diets for adults. These diets contain the minimal allowance of carbohydrate and protein used. After treatment of diabetes has been carried on satisfactorily for a long period, additions are made to the diet as required or as desired, and ultimately the majority of children are given food which corresponds to the B or C type of diet for adults. The calorie value of the diet is based on the estimate of the basal expenditure of calories as determined from Talbot's table. The allowance for activity is similar to that for adults.

Insulin

In the average uncomplicated case it is usually best to see what can be accomplished by diet before using insulin. However, in a case with ketosis, or in a case in which some complication which makes immediate control of glycosuria important, insulin must be used without delay. In such cases small doses may be used at the start and gradually increased until the urine is free from sugar. The preliminary trial of diet is advantageous since it will give the physician an opportunity to judge the severity of the case, and it will also spare the patient from any apprehension he may have toward insulin treatment before he understands it. Unfortunately, prejudice toward hypodermic treatment with insulin is widespread, and must be given consideration.

In the cases treated at The Mayo Clinic in 1931 insulin was used at the time of dismissal in 47 per cent. In only 14 per cent was the dosage in excess of 30 units each day. Improvement subsequently occurred in many cases so that insulin could be stopped, but complete information regarding the number is not available at present. However, it may be said that continuous treatment with insulin is required in much less than half of the cases of diabetes in which our methods of treatment are employed. In approximately one-fourth of cases, exact dieting alone made it possible to control the disease, and in another fourth only the simplest of dietary regulation was needed. The frequency of these mild cases of diabetes deserves emphasis, for it is on experience with such cases that misconception regarding the merits of special forms of treatment so often originates.

In cases of severe diabetes insulin must be used. There is no alternative. In milder cases, the use of insulin depends on how much food the patient is given. It is our policy to give insulin to any patient who is unable to utilize an "A" type of diet without glycosuria. It is seldom necessary to reduce the diet further. When insulin is required the amount of carbohydrate may be increased as much as desired. As a rule, however, it seems best to continue to use the diets which are relatively low in carbohydrate, particularly at the beginning of treatment. It seems to us that this policy permits the most satisfactory control of glycosuria and hyperglycemia and best favors recovery of pancreatic function. Insulin when needed is required in relatively small doses, and often is required only temporarily.

Diets containing an amount of carbohydrate equal to the normal can be used, and sometimes appeal to the patient's appetite and habits more than the type of diet described. To balance against this advantage there are two objections. Insulin is needed in almost every case. The dosage needed is small for some patients, but very large for many patients. Consequently treatment is more troublesome and more expensive. The needs and wishes of every patient must be given consideration with these points in mind.

If the patient has had diabetes for a long time, diets with more carbohydrate may be used with less reserve, for in these cases the prime consideration is to give the patient all the food he needs. Fortunately insulin makes it possible to give him almost all he wishes. The C type of diet contains a moderately large amount of carbohydrate, but in some cases much more carbohydrate may be added to it. This may be done simply by making additions in units of 20 gm. of bread (one slice) or foods having equivalent carbohydrate content. Attention must be given to the wishes of the patient, for the treatment cannot be considered satisfactory if the patient is hungry and dissatisfied. If a patient wants foods rich in carbohydrate and is willing to use the insulin needed, they need not be withheld. Now that insulin is available, diabetes can be controlled by treatment with diets of widely differing composition, but whatever type of diet is employed it is important that the patient understands how to follow it accurately, and that he is willing to follow it systematically.

INSTRUCTION

The prescription of a satisfactory diet for diabetes must be followed by instruction of the patient, and this too can be made very simple. The patient is given a menu as follows:

Breakfast

	Gm.	*Approximate measure*
Fruit, 10 per cent (grapefruit)	100	½ small sized
Cereal (oatmeal, cooked)	100	1 small serving
Bread	20	1 small thin slice
Butter	10	1 square
Bacon (cooked)	25	2 or 3 strips
Cream, 20 per cent	80	⅓ of ½ pint

Dinner

Vegetable, 5 per cent (tomato)	100	1 tomato
Vegetable, 5 per cent (sauerkraut)	100	½ cup
Vegetable, 10 per cent (beets)	100	½ cup
Fruit, 5 per cent (white cherries)*	100	½ cup
Bread	20	1 small thin slice
Butter	20	2 squares
Mayonnaise	15	1 tablespoonful
Cream, 20 per cent	75	⅓ of ½ pint
Meat (chicken)	50	1 serving

Clear broth if desired.

* Canned without sugar.

Supper

Vegetable, 5 per cent (lettuce and celery)	100	1 serving
Vegetable, 5 per cent (cauliflower)	100	½ cup
Fruit, 5 per cent (raspberries)*	100	½ cup
Bread	20	1 small thin slice
Butter	20	2 squares
Mayonnaise	15	1 tablespoonful
Cream, 20 per cent	75	⅓ of ½ pint
Milk	200	1 glass
Meat (any lean meat)	50	1 serving

Coffee or tea may be used with each meal if desired.
Carbohydrate, 103; protein, 58; fat, 151; calories, 2,003.

* Canned without sugar.

The amounts of food are given in both grams and approximate measure. The use of scales to weigh the food is advantageous if the patient has severe diabetes, and particularly if he is young, for exact dieting is important for such a case. If the patient has mild diabetes and is elderly he may estimate the proper amount of food satisfactorily if he has learned the size of average portions. The approximate measure of the foods in the menu is given for the latter type of patient.

The only point contained in this menu which is not familiar to the beginner is the mention of the classes of fruits and vegetables. An example of each is given. If the patient learns other fruits and vegetables in the same class, he can obtain a variety in these items of his diet. Even the dull and uneducated patient can learn this. He can easily obtain still more variety and also change the diet readily when any food is not available if he is provided with a list of substitutes for other foods on his original menu. An intelligent patient may be taught to calculate such substitutions for himself, but few have the interest or energy to do so. The advantage of having these substitutes calculated and ready for the patient to use is inestimable. These ready-made plans can be applied when any diet is used with standard portions.

Examples of useful substitutions are given, including recipes for salads and desserts. These are more practical than the usual recipes for diabetic diets, which are difficult to employ because a special calculation must be made to introduce each new article of food into the menu. The substitutions of single foods is extremely simple. The substitution of combinations of food by the method described is almost as simple and makes possible even more pleasing variations in diet. If the patient reads and follows the instructions he can be sure of obtaining the correct amount of carbohydrate, protein and fat. Yet he need not give a thought to the calculation of these substitutions, or the composition of the foods.

RECIPES

Mayonnaise

Mayonnaise made with salad oil by any standard recipe contains approximately the same amount of fat as butter, namely 85 per cent. Mineral oil is used if mayonnaise with no food value is desired. Commercial preparations should be avoided unless the composition is known.

Salad oil, 250 gm. (1¼ cups)
Vinegar, 1½ tablespoonfuls
One egg
Paprika (if desired) ⅛ teaspoonful
Salt, ¼ teaspoonful

Have all ingredients cold. Beat egg thoroughly. Add 2 tablespoonfuls of oil slowly, drop by drop, beating constantly. Then add 1 teaspoonful at a time until the mixture thickens. When very thick add ½ tablespoonful of vinegar. Add the remaining oil more rapidly, beating all the while. Finally add the salt, paprika and the tablespoonful of vinegar. Place the mayonnaise in a jar and keep in a cool place.

Bran, soy bean muffins

	Approximate measure
Bran, 20 gm	⅓ cup
Soy bean meal, 30 gm	¼ cup
Eggs	2
Butter, 60 gm	6 squares (4 tablespoonfuls)
Baking powder	1 teaspoonful
Salt	½ teaspoonful
Water	½ cup

Mix the dry ingredients. Add the water and melted butter. Separate the eggs, beat and add yolks to the mixture. Beat the whites very stiff, and fold carefully into the mixture. Oil 8 muffin tins. Divide batter evenly among the 8 tins and bake in a moderate oven until brown.

Each muffin contains 1 gm. of carbohydrate, 3 gm. of protein, and 9 gm. of fat. In place of 1 muffin one may use 10 gm. of 10 per cent fruit, 10 gm. of meat and 10 gm. of butter.

SUBSTITUTIONS

10 per cent fruit

In place of 100 gm. of orange (one medium-sized) one of the following may be used:

Food	*Gm.*	*Approximate measure*
Fruit, 5 per cent	200	1 cup
Fruit, 10 per cent	100	½ cup
Fruit, 15 per cent	65	⅓ cup (⅔ small apple)
Fruit, 20 per cent	50	¼ cup (½ banana)
Bread	20	1 small thin slice
Soda crackers	14	2
Cereal, dry	14	1 small serving
Cereal, cooked	100	1 small serving

5 per cent vegetables

In place of 100 gm. (½ cup) of 5 per cent vegetable one of the following vegetables or fruits may be used:

	Gm.	*Approximate measure*
Vegetable, 10 per cent	50	¼ cup
Vegetable, 15 per cent	20	⅛ cup, scant
Fruit, 5 per cent	60	¼ cup
Fruit, 10 per cent	30	⅛ cup
Fruit, 15 per cent	20	⅛ cup, scant

Bread

In place of 20 gm. (one small thin slice) of bread one of the following may be used:

	Gm.	*Approximate measure*
Vegetable, 5 per cent (cabbage, etc.)	375	1⅞ cups
Vegetable, 10 per cent (carrots, etc.)	175	⅞ cup, scant
Vegetable, 15 per cent (peas, etc.)	75	⅜ cup
Orange	100	1 medium sized
Potato	50	½ medium sized
Soda crackers	14	2
Cereal, dry	14	small serving
Corn, green	50	¼ cup
Rice, cooked	50	¼ cup
Macaroni, cooked	50	¼ cup
Flour, wheat	14	1 level tablespoonful

Bacon

In place of 25 gm. of bacon (2 or 3 strips) one egg and 10 gm. (1 square) of butter may be used.

Eggs

In place of one egg one of the following may be used:

	Gm.	*Approximate measure*
Meat, lean	25	1 small serving
Cheese	20	1 small serving
Ham	30	1 small serving
Salmon	25	1 small serving
Fish, white	35	1 small serving
and butter	5	½ square
Liver, raw	30	1 small serving
and bacon, raw	10	1 strip

Milk

In place of 200 gm. of milk (one glass) one of the following may be used:

	Gm.	*Approximate measure*
Orange	100	1 medium sized
Egg		1

Bread	20	1 small thin slice
Egg		1

Potato	50	½ medium sized
Egg		1

Cream

In place of 230 gm. (½ pint) of 20 per cent cream (coffee cream) one of the following may be used:

	Gm.	*Approximate measure*
Egg		1
Bread	20	1 small thin slice
Butter	45	4½ squares

Milk	230	½ pint
Butter	45	4½ squares

Oyster stew

	Gm.	*Approximate measure*
Milk	200	1 glass
Oysters	80	5
Butter	5	½ square

When this stew is used, omit from the meal:

Vegetable, 5 per cent	100	½ cup

Milk	200	1 glass
Egg		1

Salads

In place of 100 gm. (½ cup) of 5 per cent vegetable one of these salads may be used:

PERFECTION SALAD

	Gm.	*Approximate measure*
Lettuce	20	2 or 3 leaves
Tomato juice	50	¼ cup
Celery, cubed	15	⅛ cup
Cabbage, chopped	15	¼ cup
Vinegar		½ teaspoonful
Gelatine		½ teaspoonful
Stuffed olives		3

FRUIT SALAD

Lettuce	20	2 or 3 leaves
Fruit, 5 per cent, (any kind)	50	¼ cup

WALDORF SALAD

Lettuce	20	2 or 3 leaves
Celery, cubed	30	¼ cup
Apple	35	⅓ medium sized
Walnuts	10	4 halves

When this salad is used, omit from the meal:

Fruit, 5 per cent	100	¼ cup
Vegetable, 4 per cent	100	½ cup
Butter	5	½ square

PINEAPPLE AND CHEESE SALAD

Lettuce	20	2 or 3 leaves
Pineapple (without sugar)	25	½ slice
Cheese	20	1 cubic inch (may be grated)

When this salad is used, omit from the meal:

Egg		1
Vegetable, 5 per cent	100	½ cup

SALMON SALAD

Lettuce	20	2 or 3 leaves
Salmon	25	1 heaping tablespoonful
Dill pickle, cubed	50	¼ cup
Celery, cubed	30	¼ cup

When this salad is used, omit from the meal:

Vegetable, 5 per cent	100	½ cup
Egg		1

CHICKEN SALAD

	Gm.	*Approximate measure*
Lettuce	20	2 or 3 leaves
Chicken, cubed	25	1 heaping tablespoonful
Celery, cubed	30	¼ cup

When this salad is used, omit from the meal:

Vegetable, 5 per cent	50	¼ cup
Egg		1

Desserts

FRUIT GELATINE WITH WHIPPED CREAM

	Gm.	*Approximate measure*
Orange	50	½ medium sized
Banana	30	¼ medium sized
Water		½ cup
Gelatine		½ teaspoonful
Saccharine		¼ grain
Whipped cream (40 per cent)	15	1 heaping tablespoonful

When this dessert is used, omit from the meal:

Fruit, 5 per cent	100	½ cup
Vegetable, 10 per cent	100	½ cup
Butter	5	½ square

PINEAPPLE BAVARIAN CREAM

Pineapple, shredded (canned without sugar)	110	½ cup
Gelatine		½ teaspoonful
Water, cold		2 tablespoonfuls
Saccharine		¼ grain
Whipped cream (40 per cent)	15	1 heaping tablespoonful

When this dessert is used, omit from the meal:

Fruit, 5 per cent	100	½ cup
Vegetable, 10 per cent	100	½ cup
Butter	5	½ square

PLAIN CUSTARD

Egg		1
Milk	200	1 glass
Saccharine		½ grain
Vanilla		4 drops

This makes two custards. When one custard is used, omit from the meal:

Fruit, 5 per cent	100	½ cup
Egg		1

ICE CREAM

Egg		1
Cream, 20 per cent	100	½ cup
Vanilla		2 drops

When this dessert is used, omit from the meal:

Egg		1
Cream, 20 per cent	100	½ cup

CLASSIFICATION OF FRUITS (CANNED WITHOUT SUGAR) ACCORDING TO CARBOHYDRATE CONTENT

5 per cent	*10 per cent*
Strawberries	Pineapple
Peaches	Pears
Blackberries	Apples
Loganberries	Cherries, black
Apricots	White grapes
Cherries, red and white	
Raspberries	
Grapefruit	

Fruits canned without sugar as obtained on the market ordinarily contain the amount of sugar indicated above. The classification of fresh fruits is available in every book on the treatment of diabetes.

CONCLUSION

Dietary treatment alone can control diabetes in more than half the cases (53 per cent). In the remainder (47 per cent) diet must be used in conjunction with insulin. Many patients who fail to receive effective treatment may be helped by simplification of methods. The procedures here described have been employed successfully for three years, and have facilitated the prescription of diets and instruction of patients.

THE VALUE AND INDICATIONS OF INTRAVENOUS INJECTIONS IN SURGERY*

JOHN H. LYONS, M.D.

Associate in Surgery, George Washington University School of Medicine

The intravenous route eliminates faulty digestion and faulty absorption as possible barriers to distribution and action. In surgery, as in medicine, drugs may be administered in a vein when unusually prompt action is urgent. In addition, the intravenous injection of various dyes, such as methylene blue and gentian violet, has been recommended in blood-stream infections, but there have been varying opinions as to its value. In some cases it has seemed of undoubted value, and in others it has seemed to have no effect whatsoever.

* Read before the Society, November 9, 1932, as one of a series of papers of a symposium on intravenous therapy.

In general, the indication for intravenous therapy is the need to administer a comparatively large amount of fluid in a comparatively short time with a minimum amount of discomfort. This need arises preoperatively, after accidents, and after operations. The fluids that may be used are normal and hypertonic salt solution, the various combinations of different salts, such as Ringer's and Hare's solutions, solutions of glucose, acacia, gelatin and blood.

Preoperatively, if the patient is dehydrated, as often occurs in obstructing lesions of the gastrointestinal tract and following severe diarrhea, the operative risk is lowered if large quantities of normal salt solution be given intravenously.

Surgical conditions, such as bleeding hemorrhoids and fibroids, bleeding peptic ulcer and some types of malignancy, sometimes produce such a marked degree of anemia that operation would entail a tremendous risk. In such cases one or more transfusions are indicated. Blood is not only added but the blood-forming system is stimulated. The degree of anemia requiring transfusion varies with the operation to be done, but generally speaking, we may accept 50 per cent as the dividing line. The question of whether to use whole or citrated often comes up. While the former probably has some advantages in certain cases, the simplicity of using citrated blood and the fact that it has proved satisfactory in most surgical conditions, undoubtedly entitles it to first consideration.

Jaundice, especially of severe degree or long duration, often decreases the coagulability of the blood to such an extent that operation is prohibitively unsafe. While the intravenous administration of calcium chloride usually brings the coagulation time down to normal in such cases, sometimes it is necessary to resort to transfusion in order to accomplish this. In true purpura, purpura hemorrhagica thrombocytopenia, the bleeding time is usually greatly prolonged, but by resorting to transfusion, the bleeding time may be so reduced that a curative splenectomy may be done without prohibitive risk.

After accidents and operations, intravenous therapy is used in treating shock, hemorrhage, and sepsis, and also to furnish adequate fluids to patients to whom we can not or do not wish to give fluids by mouth or by rectum. As examples of the latter, patients with extensive resection of the colon and patients with general peritonitis may be cited. A fair degree of physical well-being can be sustained over a period of at least 16 days without alimentary feeding if sufficient glucose solution is given intravenously.

In shock, intravenous therapy is most valuable. Without entering into a discussion of the theory of the cause of shock or its types, I want to call attention to one condition which is present in shock, namely a decreased blood volume with a normal or increased red-cell count and hemoglobin reading. That means there is a loss of the fluid content of the blood, but not of the cells. Rational treatment demands that this fluid be made up and kept up. In other words, in addition to the usual measures of keeping the patient warm, elevating the foot of the bed, and administering morphine, the blood volume must be increased. Transfusion is the best way to accomplish this, but it should be done early, for when given late it may be of no avail. But there is a real need for a safe, ready, and inexpensive fluid to be injected intravenously instead of blood. A transfusion is comparatively expensive, and the securing of willing and suitable donors is often time-consuming. Fluid volume in the circulation can be replaced and the blood pressure raised by using solutions of glucose or salt, or their combinations. But the maximum rise in blood pressure is maintained for only about a half hour. The fluid rapidly disappears from the vessels. The injection of 6 per cent acacia solution produces a marked rise in blood pressure which is maintained, and there are no deleterious effects of the acacia in the blood. This solution can be injected with no loss of time and very little expense. Ampoules are manufactured, the contents of which diluted to 500 cc. with freshly distilled water gives a solution of 6 per cent acacia and 0.9 per cent salt, which is satisfactory for the purpose. The use of acacia has been subjected to severe criticism in the past, but the unfavorable reactions have been largely eliminated by the use of the purest forms of acacia and by the careful administration of the solution. Gelatin solution has been used in the treatment of shock, but it is not as satisfactory as acacia.

In the treatment of hemorrhage, transfusion is our main method. However, one should always remember that the introduction of a large quantity of fluid into the vascular system may cause increased bleeding when the hemorrhage is subsiding. Therefore, it is advisable whenever possible to control the bleeding before injecting any considerable amount of fluid intravenously. However, this is not always possible, especially in gastrointestinal hemorrhages, and it often happens that the transfusion seems to control the bleeding, possibly by increasing the coagulability of the blood. Intravenous injections of solutions of salt, glucose, or acacia are valuable adjuncts to transfusion in treating hemorrhage.

In certain types of hemorrhage, auto-transfusion, probably better called auto-hemofusion, may be valuable and even life-saving. This consists of intravenous injection of a patient's own blood, which has escaped into his abdominal cavity. Of course, it is only applicable in cases in which there is no possibility of infection of the blood, as in ruptured ectopic pregnancy and ruptured spleen or liver, not associated with any possible contamination through injury to the gastrointestinal tract. Auto-hemofusion has the advantages of being inexpensive and eliminating the necessity of typing and matching the blood of the donor and recipient, with the resulting loss of time.

In sepsis, the intravenous route often enables us to administer larger quantities of fluids than can be given in any other way and thus to favor the dilution and elimination of toxins. It is in such cases that intravenous injections of normal salt solution are very valuable. Transfusions in septic cases serve a double purpose. In addition to furnishing fluids, they probably also increase the resistance of the patient to the infecting organism. In this type of cases, I believe it is often advisable to resort to the so-called exsanguination transfusion. This consists of first withdrawing approximately 500 cc. of the patient's blood and then transfusing him with the donor's blood. I have used this procedure several times and believe it is often to be preferred to simple transfusion, in septic cases. It has been shown that dehydration may result from extensive superficial burns and may be corrected by intravenous administration of fluids.

There are two other conditions I wish to mention in which intravenous therapy has been recommended. In edema of the brain the injection of hypertonic salt solution or strong glucose solution will bring about dehydration of the brain. It is generally accepted that the procedure is indicated in cases of chronic edema, but in the acute cases, as in fractured skull and cerebral concussion, there is a difference of opinion. Some recommend it, while others condemn it, the latter holding that the reduction in the size of the brain incident to the decrease of edema favors more hemorrhage.

In thrombo-angiitis obliterans the results of the injection of typhoid vaccine intravenously justify a continuation of its use. Following the injection there is a generalized chill, followed by a rise of 3 to 6 degrees by mouth and a rise in surface temperature of approximately 3 degrees to each degree of elevation of mouth temperature. The elevation of surface temperature is maintained for several days after the mouth temperature returns to normal, and it is probably this increase of surface temperature which brings about the relief of pain and the improvement in the ulcerative process. The degree of elevation of surface temperature is also an index of the improvement that may be expected to follow an operation on the sympathetic nervous system.

No discussion of this subject, however brief, should fail to mention the dangers of intravenous therapy. They are venous thrombosis, sloughing of tissue about the site of injection, the introduction of infection, the introduction of air and blood clots as emboli, acute dilatation of the heart, and agglutination or hemolysis of the donor's or recipient's corpuscles. The prevention of these dangers does not come within the scope of my subject, but it is well to consider them whenever one resorts to the use of intravenous methods. The intravenous route should not replace the older and simpler modes of administration but should be substituted only when definitely indicated.

THE EFFECT OF CERTAIN RELAXANTS UPON THE UTERUS DURING LABOR

A Supplementary External Hysterographic Study

Samuel M. Dodek, M.D.

Clinical Instructor in Obstetrics and Gynecology, George Washington University School of Medicine

In previous communications the writer presented and described a new method for graphically recording the contractions of the parturient human uterus. The method affords a means by which the uterine contractions during first or second stage labor may be studied, and permanent tracing records conveniently made without the necessity of introducing any portion of the apparatus into the uterine cavity or birth canal, or disturbing the patient. The method is called external hysterography and the apparatus, the external hysterograph. (The hysterograph should not be confused with the tocodynometer, an instrument used to measure the contractions of the uterus in units of force.)* The action of certain analgesics, anesthetics and stimulants upon the uterus in labor was studied and reported. This supplementary report deals with the action of a less extensively employed but nevertheless useful class of agents, the relaxants.

Rudolph and Ivy have studied the physiology of the uterus in labor in laboratory animals and have contributed valuable information regarding the action of certain drugs upon the pregnant uterus of the dog and rabbit in situ. Among their studies they observed the action of epinephrine solution and traced the uterine reactions upon a smoked drum. Their results indicated that this drug has an inhibitory effect upon the contractions of the uterine musculature and causes relaxation. The effect of epinephrine on excised strips of muscle from the pregnant and non-pregnant human uterus stimulates contractions according to a number of observers, and the drug was once thought to be useful in uterine inertia. Yet Rucker in 1927 reported that epinephrine relaxed the contraction ring of the human uterus in 3 cases, and Bourne and Burn also demonstrated, by internal hysterography, that the contractions of the uterus could be inhibited by the injection of epinephrine.

In 1931 Rucker again observed that after an injection of epinephrine there was a relaxation of the musculature of the Fallopian tubes and that, on the other hand, pituitary extract increased the tonicity of the tubal musculature.

Patients who were subjects in the present study were given doses of from 3 to 16 minims of 1:1000 dilution of epinephrine hypodermically when they were actively in labor but not under the influence of anesthesia. Nearly all of them experienced a general feeling of mild compression and weakness which lasted for varying lengths of time and during which periods there were either no contractions or markedly depressed contractions of the uterus, in spite of the fact that they had been occurring at very frequent intervals. As soon as the patient began to feel more comfortable the uterus again began to take up its regular rhythmic contractions and the tracings which followed appeared as before the injection. It seems evident, therefore, that during the periods of its maximum effect, epinephrine has an inhibitory action upon the contractions of the human uterus in labor. Hysterograms bear out the contention, and typical tracings have been selected for presentation here.

---

* A working diagram for the construction of the author's External Hysterograph appears in the "Year Book of Obstetrics and Gynecology, Practical Medical Series, Chicago, 1932."

Figure 1* demonstrates, in part, the normal uninfluenced contractions of a primiparous patient in labor, the cervix 3 fingers dilated. The tracings are typical of first stage labor, revealing irregularly intense and unequal contractions recurring about every 1 to 1½ minutes. At point *B*, during a pain, 3 minims of 1:1000 dilution of epinephrine were injected hypodermically into the mother. At the end of that pain (contraction) there was a complete cessation of uterine activity for 4 minutes, when at *C* the tracings again resumed their former characteristics.

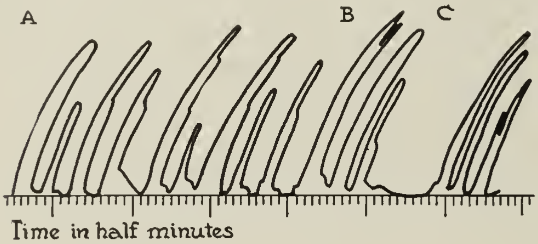


Fig. 1. Primipara, First Stage Labor

B, hypodermic injection of 3 minims of 1:1000 epinephrine; *C*, normal contractions resumed after cessation of activity for 4 minutes.

The uterus seems to react to epinephrine during labor in an approximately direct proportion to the quantity injected. In Figure 2, after tracings were made of first stage labor in a primiparous patient for 24 minutes, 1 cc. of epinephrine was injected hypodermically into the mother at point *B*. It is obvious that contractions ceased at once for 7½ minutes, after which the uterus contracted very feebly for an additional 9 minutes. It may be said that the uterus was practically inactive for a period of 16½ minutes.

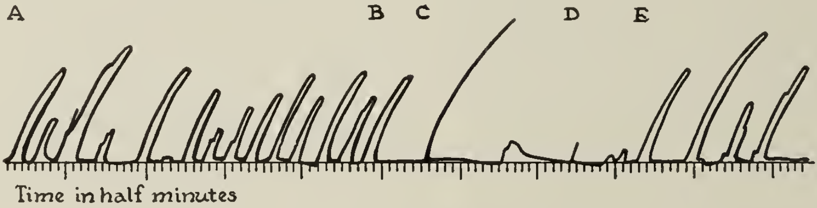


Fig. 2. Primipara, First Stage Labor

B, hypodermic injection of 1 cc. of 1:1000 of epinephrine; *C*, contractions cease; *D*, fetal movement; *E*, contractions resumed as at *A*. Long single tracing between *C* and *D* due to vomiting.

The relaxant property of this drug is of value when an irritable uterus prevents complete relaxation even under deep anesthesia. In practice, when a tight contraction ring about the child's neck prevents completion of forceps extraction, or when a tight contraction ring about the after-coming head forewarns of disaster if additional traction is made upon the fetal trunk, in breech extraction for primary breech presentation, or following internal podalic version, a hypodermic injection into the maternal tissues of 5 to 15 minims of 1:1000 solution of epinephrine, in addition to the anesthesia, often gives sufficient relaxation for a sufficient length of time to allow a safe termination of the second stage. The early, advised and if necessary, quickly repeated use of this relatively harmless agent may prevent extensive trauma to the cervix and lower uterine segment, and damage to the baby, which would necessarily follow delivery by brute force.

I have found that in the human, epinephrine counteracts in a measure the effect of pituitary extract, just as Rudolph and Ivy found in the laboratory animal.

The patient represented by the hysterogram of Figure 3 was given 1 minim, or ⅔ International Unit, of pituitary extract. Three minutes later the contractions occurred with increased frequency and intensity at the rate of every ½ to 1 minute, whereas before they appeared at intervals of from 2½ to 7 minutes. Eight minutes after the first evidence of the effect of the pituitary extract was noticeable, 1 cc. of epinephrine solution was injected (at point *D*). Almost immediately the contractions recurred less frequently and the intervals were gradually prolonged until in 8 minutes they recurred at normal intervals and gradually subsided to the original frequency. Under ordinary circumstances the action of unantagonized pituitary extract in the dose usually advised to stimulate labor persists for about 20 minutes.

---

* The hysterograms in the figures which accompany this article have been redrawn from the originals to produce better printing plates.

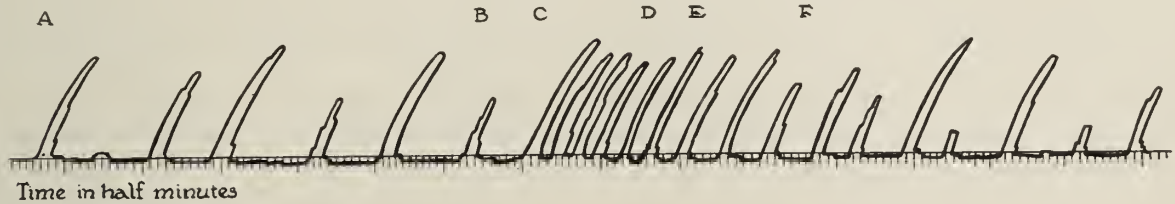


Fig. 3. Epinephrine vs. Pituitary Extract

A to *B*, normal uninfluenced contractions of first stage labor; *B*, injection $\frac{2}{3}$ I.U. pituitary extract; *C*, increase in frequency and intensity of uterine contractions; *D*, injection of 1 cc. epinephrine solution; *E*, intervals becoming longer; *F*, intervals, between contractions, of original frequency.

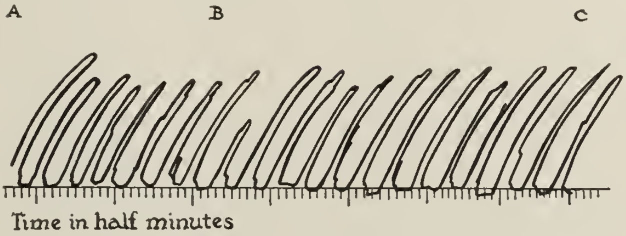


Fig. 4. Primipara, First Stage Labor

A to *B*, uninfluenced contractions; *B*, hypodermic injection of $\frac{3}{4}$ grain ephedrine; *B* to *C*, no significant change in tracings.

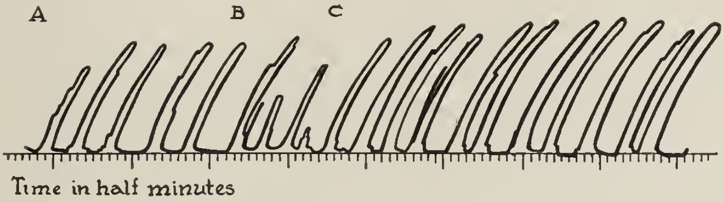


Fig. 5. Multipara, First Stage Labor

A to *B*, uninfluenced contractions; *B*, hypodermic injection of $\frac{3}{4}$ grain ephedrine; *C*, slight increase in intensity and frequency of uterine contractions probably due to the advance of labor.

Although ether is commonly used to quell the over-tumultuous contractions which sometimes follow the inadvised use of standardized pituitary extract or that now standardized pituitary and thymus extract, "Thymophysin," the rapid antagonistic action of epinephrine should not be lost sight of in such instances.

Ephedrine, a midriatic alkaloid from *ma huang* is said to be related in chemical constitution and in physiologic action to epinephrine. It is also said to have an effect on smooth muscle, on secretion and on the circulation similar to that of epinephrine, and is used in states of low blood pressure, shock, hemorrhage, and also in asthma. It occurred to me, therefore, that in view of the analogous properties of these two drugs, ephedrine might effect the uterus in a manner similar to epinephrine.

External hysterographic studies of the effect of ephedrine were disappointing, however, when relaxant properties were sought. There is no similar action between these two drugs as far as their pharmacodynamic influence on the parturient human uterus is concerned. Figure

4 conclusively demonstrates this assertion. The case of Figure 4 was a primiparous patient in first stage labor, the vertex presenting as a left occipitoposterior and the cervix dilated 4 cm. From *A* to *B* the hysterogram is uninfluenced by any drug. At *B* a hypodermic injection of $\frac{3}{4}$ grain of ephedrine was given to the patient. For the next 25 minutes there were no marked changes in the contractions, and the tracings continued uninfluenced. On the other hand, a similar injection given to a multiparous patient at point *B* in Figure 5 was followed in 10 minutes by contractions which made tracings suggesting increased intensity, but since this finding was not consistent in other patients upon whom similar studies were made, the stronger contractions were attributed to the advance of labor. The conclusion follows that ephedrine has a place in labor only when it may be called upon to combat falling blood pressure and shock, or in sudden bronchial spasm which may come on in the asthmatic mother with the first inhalation of gas or ether.

Summary and Conclusions

1. Attention has been recalled to an original method and apparatus previously presented for external hysterography during labor.
2. References have been made to the experimental work of other observers with the action of epinephrine solutions upon the uteri of the human female and laboratory animals.
3. External hysterograms reveal that solutions of epinephrine in 1:1000 dilution and in doses of 3 to 15 minims inhibit completely the contractions of the human uterus in labor for periods of time varying from 4 to 16 minutes.
4. The inhibitory effect of epinephrine upon the contractions of the parturient human uterus is of value in obstetric practice, to relax a contraction ring or a tonic uterus, with the help of general anesthesia, when these conditions interfere with safe operative termination of the second stage of labor vaginally.
5. The rapid antagonistic action of epinephrine to pituitary extracts should be kept in mind in cases of the inadvised use of the latter during first or second stage labor.
6. Despite the analogous properties of ephedrine and epinephrine, the former does not have an inhibitory action on the contractions of the human uterus in situ.

BIBLIOGRAPHY

Bourne, A., and Burn, J. H.: The Dosage and Action of Pituitary Extract and of the Ergot Alkaloids on the Uterus in Labour, With a Note on the Action of Adrenalin. J. Obst. & Gynec. Brit. Emp., 1927, **34**, 249.

Dodek, S. M.: A New Method for Graphically Recording the Contractions of the Parturient Human Uterus; A Study of the Effect of Certain Sedatives, Anesthetics, and Stimulants upon the Uterus in Labor. Surg. Gynec. & Obst., 1932, **55**, 45.

Dodek, S. M.: External Hysterographic Studies of the Effect of Certain Analgesics and Anesthetics upon the Parturient Human Uterus. Current Researches in Anes. & Anal. (To be published.)

Rucker, M. P.: The Treatment of Contraction Ring Dystocia with Adrenalin. Am. J. Obst. & Gynec., 1927, **14**, 609.

Rucker, M. P.: L'epinephrine dans le traitement de la dystocie de Demelin. Gynec. et obst., 1931, **23**, 412.

Rudolph, L., and Ivy, A. C.: The Physiology of the Uterus in Labor; Experimental Study of Dog and Rabbit. Am. J. Obst. & Gynec., 1930, **19**, 317.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS

Report of Cases

Edward A. Cafritz, M.D.
Washington, D. C.

Congenital hypertrophic pyloric stenosis is one of the most important surgical conditions encountered in early infancy. Thirty years ago it was regarded as a pathological curiosity, only diagnosed after death and invariably fatal. Today, while it cannot be regarded as a common condition, its symptomatology is so definite that an early diagnosis is essential for a rapid cure whether it be under medical or surgical supervision.

The etiology of pyloric stenosis has not been definitely determined. In the present state of knowledge it is reasonable to believe that the hypertrophy of the circular fibers of the pyloric ring is present at birth and may manifest itself at once; but that when the narrowing is of mild degree it gives no symptoms until some irritation (such as indigestion or hyperacidity) produces spasm, and this (probably aided by a catarrhal thickening of the mucosa) sets up the obstruction.

The general clinical picture is a striking one. An infant who for the first two or three weeks has shown no signs of gastric disorder, and often has been nursing and gaining regularly in weight, begins to vomit, at first occasionally but soon habitually. The vomiting is not the ordinary gastric regurgitation of indigestion but is forcible and projectile. The bowels are constipated. There is no fever and little or no evidence of pain. The vomiting has usually a relation to the taking of food. It most frequently comes directly after the meal, often while the child is still at the breast.

Progressive wasting is one of the striking symptoms. The rate of loss depends upon the completeness of the obstruction, the amount of vomiting and the degree of constipation.

On examination of the abdomen the epigastrium is usually full and the lower half of the abdomen sunken. Distinct waves of contraction pass from left to right across the stomach region, beginning in the left hypochondrium and traveling to the pyloric end. The waves are most prominent after the intake of food or drink or may be excited by percussion or massage over the stomach. A tumor mass about the size of an olive can usually be felt near the median line. This tumor can be best palpated when the infant is relaxed and the stomach is emptied either by vomiting or emptied by passing a catheter into the stomach.

The conditions with which hypertrophic stenosis is most likely to be confused are cases of mild degree of stenosis or spasm and the duodenal atresias, which may be partial or complete. Duodenal atresias are quite rare, vomiting usually occurring in the first days of life with the presence of bile.

The X-rays after ingestion of barium or bismuth may be a valuable means in determining emptying time, motility, malpositions, contractions, adhesions, scars, ulcerations, dilatations, and stenosis of the stomach and pylorus. I feel that this is not a necessity in most cases. The finding of a firm palpable tumor in the case of persistent vomiting and wasting which resists proper feeding and medical treatment justifies a diagnosis of hypertrophic stenosis.

The treatment is surgical in all cases in which narrowing exists to such a degree that the infant, although properly fed and cared for, cannot maintain his nutrition and advance in weight and strength.

All of these cases which I have operated upon were first treated medically with the thickened-feed method, atropin, lavages, etc. Case 3 of this series underwent a second course of medical treatment since I felt that the patient's condition and general appearance justified a further trial.

The first reported operation for hypertrophic stenosis was a gastro-enterostomy by Stein in 1897. Stiles tried pylorectomy in 1900. Of pylorodiosis there are two principal methods, Hahn's and Loreta's. Hahn's method seeks to effect divulsion without any incision into the pylorus or stomach. By Loreta's method a small incision is made in the stomach wall near the pylorus. The finger, bougies in graded sizes or a forceps is passed through the wound and on through the pylorus which is thereby dilated. The incision in the stomach is then sutured. The Finney operation is simply a gastro-duodenostomy. Gastro-enterostomy was recommended by Scudder of Boston. Fredet released the mucous layer without opening it by cutting through the serous and muscular layers in a direction longitudinal to the tumor, and after partly dissecting the muscular from the mucous layer, he attempted to widen the lumen and cover the raw surfaces by converting the longitudinal incision into a transverse suture line. Weber performed and recommended the same operation, attempting to do a Weber's partial extra-mucous pyloroplasty, found the sutures would not hold and since the patient's condition precluded prolonging the operation, he left the muscle ununited and closed the abdomen. The patient recovered and did well and the operator afterwards performed deliberately what he at first had been compelled to do in an emergency.

The Fredet-Rammstedt operation which I

have performed in this series is the most approved at present. It has been found entirely satisfactory and gives a permanent result. While the operation is mechanically simple, there are a few details essential for its success. The stomach is emptied before the child is brought to the operating room by passing a rubber catheter. The incision used is an upper right rectus about 1½ inches long and about ½ inch from the mid-line and high enough to completely overlie the right lobe of the liver. This makes closure of the abdomen easier and practically insures against postoperative rupture of the wound. When the abdomen is opened, the right lobe of the liver is retracted upward and the pylorus delivered into the wound. The tumor is held between the thumb and the index finger. Beginning at the duodenal end, an incision is made over the entire extent of the tumor in its superficial part of the circular muscle only. The edges of the cut muscle are then separated with a small mosquito forceps until the mucous membrane completely fills the incision. The pylorus is then dropped back and the abdomen closed in routine fashion.

The complication most to be dreaded is accidental opening of the duodenum. This happened in Case 2 but without serious results. Other complications were not encountered in this series, such as hemorrhages, wound rupture, wound infection, pneumonia, etc. Postoperative nursing of the child is a very important factor in the treatment.

In this series all of the patients made an uneventful recovery and were discharged from the hospital in from 5 to 10 days, improved in weight and health. Ether was used as the anesthetic in all.

REPORT OF CASES

Case 1: A boy, aged 5 weeks, breast-fed, weighing 7 pounds, at birth (1926), had been nursing regularly. Projectile vomiting had occurred after every feeding for a week. Active peristalsis was visible and a tumor mass palpable. Medical treatment failed. Operation was successful; the patient gained normally following operation.

Case 2: A boy, aged 4 weeks, breast-fed, weighing 8 pounds, 13 ounces, at birth, had been nursing regularly. For 2 weeks had been vomiting shortly after each feeding. He cried most of the time. Active peristalsis was quite evident with a palpable tumor mass. Medical treatment was tried without results. X-ray showed complete retention of barium in stomach with gas distention. Operation was performed, May 7, 1927, with excellent results.

Case 3: A boy, aged 4 weeks, breast-fed, weighing 8 pounds, 4½ ounces, at birth, had been nursing regularly. For 10 days shortly after each feeding he vomited the entire stomach contents in the projectile manner. He was losing weight gradually. The child slept very little and cried considerably. The abdomen was somewhat distended. The appetite was very good. Active peristalsis was present and a tumor mass palpable. Medical treatment was instituted without results. Operation was performed, April 15, 1929, with excellent results.

Case 4: A girl, aged 6 weeks, breast-fed for the first 1½ weeks, weighing 7¾ pounds at birth, had been nursing regularly. For 3 weeks she had been vomiting, at times immediately and at other times 20 minutes after feeding. The child was very constipated. The appetite was good. Active peristalsis was quite evident, with the presence of palpable tumor mass. Medical treatment was tried without results. Her weight at time of operation was 5 pounds. Feeding had been changed several times before operation was attempted. Operation was performed, December 23, 1930, with excellent results.

Case 5: A boy, 4 weeks old, breast-fed, weighing 10½ pounds at birth, had been nursing regularly but for a week. Vomiting projectile in character began, and he was gradually losing weight. Active peristalsis was quite evident, but a tumor could not be palpated. Medical treatment was tried. X-ray showed a 60 per cent retention after 3 hours. Operation was performed, May 28, 1929, with excellent results.

Case 6: A boy, aged 3 weeks, breast-fed, weighing 7 pounds, 6 ounces, at birth, had nursed regularly, but for 5 days had been vomiting shortly after each feeding. He cried most of the time. The abdomen was distended, and active peristalsis was noticed at irregular intervals. The taking of food had a tendency to increase the peristalsis. A tumor mass could not be palpated. Medical treatment was tried without results. Operation was performed, September 26, 1931, with excellent results. The patient was discharged from the hospital on the 5th day.

Case 7: A girl, aged 3 weeks, breast-fed, weighing 6 pounds, 10 ounces, at birth, had nursed regularly, but for 7 days had vomited after each feeding. This began gradually and became progressively worse, becoming projectile in character. Active peristalsis was noted at irregular intervals; tumor mass could not be palpated. X-ray showed 85 per cent barium retention. Occasional very small greenish bowel movements occurred. Medical treatment was tried without results. Operation performed, November 2, 1932, with excellent results. The patient was discharged from the hospital on the 5th day.

(*Continued on page 46*)

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D.
C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D.
Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1932–33
President . . . . Harry A. Fowler, M.D.
1st Vice-President . . . . Henry R. Schreiber, M.D.
2nd Vice-President . . . . H. Gladys Kain, M.D.
Secretary-Treasurer . . . . Coursen B. Conklin, M.D

THE RÔLE OF THE PARATHYROID GLANDS IN CHRONIC DISEASES OF THE BONES

Since Erdheim's[1] article in 1903, the control of calcium metabolism by the parathyroid bodies has been generally accepted but indefinitely understood. Erdheim believed that dysfunction of these small organs caused changes, both in the blood calcium and in the bones. Since then other observers noted that extirpation of the parathyroids caused tetany. From that time until about five years ago, the parathyroids created little interest in medical literature. After the finding of tumors of the islets of Langerhans in the pancreas with associated hyperinsulinism, clinicians began to notice the association of a group of symptoms which seemed to be due to hyperfunction of the parathyroid bodies. Tumors of the parathyroid glands were reported by several observers, notably, Gunther, Mandl, Verbitz, Hunter and Turnbull; these tumors were associated with changes in the bones of the fibrocystic and decalcification type. Some of the reported cases showed only a marked granular type of osteoporosis as described by Camp.[2] In 1931 Hunter and Turnbull[3] stated that there had been reported in the literature 32 cases of generalized fibrocystic disease with definite proof of hyperparathyroidism associated with parathyroid tumor or tumors. Camp has recently added 3 more cases to this number. According to these authors, definite improvement was noted in the osseous lesions after the surgical removal of these tumors, and in some of the cases complete cure resulted. As soon as these results were noted, a number of workers started extensive experimental work in an attempt to produce changes in the bone and variation in the serum calcium by the injection of parathyroid extracts and hormones into experimental animals. Jaffe and his co-workers,[4,5] Johnson and Wilder[6] and many others have done a large amount of work along this line in the last three years. These workers were almost uniformly able to produce the same changes in bones in experimental animals as were observed in the bones of patients with hyperparathyroidism and associated parathyroid tumors. Changes in the amounts of the calcium and phosphorus in the blood serum occurred at the same time. Ballin and Morse[7] have been among the leaders in this country in advocating the removal of parathyroids, whether tumors existed or not, for the cure of fibrocystic

---

[1] Erdheim, J.: Zur normalen und pathologischen Histologie der Glandula thyreoidea, parathyreoidea und Hypophysis. Beitr. z. path. Anat. u. z. allg. Path., 1903, **33**, 158.

[2] Camp, J. D.: Osseus Changes in Hyperparathyroidism. A Roentgenologic Study. J. A. M. A., 1932, **99**, 1913.

[3] Hunter, D., and Turnbull, H. M.: Hyperthyroidism: Generalized Osteitis Fibrosa, with Observations upon the Bones, the Parathyroid Tumors and Normal Parathyroid Glands. Brit. J. Surg., 1931, **19**, 203.

[4] Jaffe, H. L., Bodansky, A., Dresser, R., and Hampton, A. O.: Osteitis Fibrosa Cystica Generalisata with Hyperparathyroidism as Etiology. Am. J. Roentgenol., 1931, **25**, 739.

[5] Jaffe, H. L., Bodansky, A., and Blair, J. E.: Effects of Parathormone and Ammonium Chloride on Bones of Rabbits. J. Exper. Med., 1932, **55**, 695.

[6] Johnson, J. L., and Wilder, R. M.: Experimental Chronic Hyperparathyroidism. Metabolism Studies in Man. Am. J. M. Sc., 1931, **182**, 800.

[7] Ballin, M., and Morse, P. F.: Parathyroidism and Parathyroidectomy. Ann. Surg., 1931, **94**, 592.

(von Recklinghausen's) disease. These and the other workers have secured some outstanding results, so much so that it is now generally recognized that parathyroid dysfunction is the dominating if not the only cause of generalized osteitis fibrosa cystica. Some of this work is so recent that it has not yet been published in the medical literature. At the annual meeting of the American Roentgen Ray Society in Detroit, one whole afternoon was devoted to the discussion of this subject. It was likewise one of the principal subjects of consideration of the Radiological Society of North America at Atlantic City. The Index Medicus of the year 1931 lists 151 articles concerning parathyroid conditions and 192 articles for the year 1932. A decade ago the parathyroids received little consideration. For the last year it has been noted that the Journal of the American Medical Association has abstracted almost every article pertaining to the parathyroid bodies occurring in the journals reviewed. The parathyroids at the present time are, therefore, exciting an exceptional amount of interest. Roentgenologically and histopathologically the similarity of fibrocystic disease, Paget's disease, bone cysts, all of the forms of osteochondritis juvenalis, rickets, giant-cell tumors, and many other rare forms of benign osseous conditions are very similar in many respects. The histopathologic pictures of many of these conditions are difficult to differentiate. It has long been suspected that these conditions might be associated both as to etiology and course. In a review of the microscopic appearance of 300 cases of giant-cell tumors studied at the Mayo Clinic and from the American College of Surgeons' Bone Registry, Moore[8] has become firmly convinced that giant-cell tumors are not true neoplasms. In many cases, biopsies of old giant-cell tumors show a condition that is impossible to differentiate from osteitis fibrosis cystica and bone cysts. There are many cases of fibrocystic changes in the bone in which definite parathyroid hyperplasia or tumors cannot be demonstrated. Hitzrot and Comroe[9] enthusiastically recommend the removal of the parathyroids in cases of fibrocystic disease, even though no tumor is found. They reported such a case as having fully recovered after operation. This procedure is not so easy as it may appear because of the small size of the normal parathyroids and their variable location. Cuneo and Blondin,[10] in a study of the surgical anatomy of the parathyroid glands stated that 95 per cent of the parathyroids are behind the lateral lobe of the thyroid, usually just above or below the inferior thyroid artery and outside of the thyroid capsule, 4 per cent lie just underneath the capsule behind the lateral lobe, and 1 per cent lie anywhere within the thyroid gland substance. Ballin and his associates[7] are of the opinion that parathyroids may occur almost anywhere within the thyroid gland substance, or anywhere in the immediate neighborhood. In Hitzrot's[9] case, he had to operate more than once to remove enough of the parathyroid glands. Except in extreme cases this multiple removal is a rather drastic surgical procedure. Merritt[11] has reported the complete cure of a patient with fibrocystic disease and osteoporosis of the lower end of the femur by deep roentgen therapy. The treatment was just as simple and painless as treatment of any other condition with X-ray. If further experience shows roentgen therapy to be effective in other cases of hyperparathyroidism, the patient may be saved an operation in which hours may be spent unsuccessfully searching for the small parathyroid bodies. When a definite tumor can be palpated, surgical removal would still probably be preferable, but a radiologist should be consulted and agree with the type of treatment. It is only possible to sketch in a brief way the enormous amount of work and thought that has been given to this subject. The biochemist, the physiologist, the internist, the radiologist, and the surgeon are all equally interested. There are a large number of rarer diseases of the bone that have been imperfectly understood, the etiology of which is unknown. Now that we are learning more about the parathyroid function, immediately the idea arises that such rare conditions as osteomalacia, marble bones,[12] osteogenesis imperfecta, Perthe's disease, Osgood-Slatter's disease and Koehler's disease may be merely manifestations of parathyroid dysfunction. Jaffe and his co-workers[13] have found that a single dose of parathyroid extract produces rapid and extensive decalcification of the bones of young rabbits. Selye[14] injected parathyroid hormone into normal rats, producing a typical scleroderma. After discontinuance of the hormone the scleroderma promptly cleared up, leaving only an atrophy of the skin. The field for experimental work is unlimited. The healing of fractures with over-production of callus, the failure of ossification in fractures, or bone absorption after injury may be due to failure of proper control by the parathyroids. The healing of chronic infections, particularly tuberculosis, is frequently associated with considerable calcification of the area involved. Our knowledge of calcium metabolism and the function of the parathyroid bodies is still too limited to draw definite conclusions, however, except in true fibrocystic disease. It is not impossible that in the future cases of tuberculosis may be cured by calcification brought about through intentional alteration and control of parathyroid function.

---

[8] Moore, Claude: Giant-Cell Tumors are not a True Neoplasm. (To be published.)

[9] Hitzrot, L. H., and Comroe, B. I.: Hyperparathyroidism without a Parathyroid Tumor; Report of Case Improved by Partial Parathyroidectomy. Arch. Int. Med., 1932, **50**, 317.

[10] Cunéo, B., and Blondin, S.: Surgical Anatomy of Parathyroids. J. méd. franc. 1932, **21**, 19.

[11] Merritt, E. A.: Irradiation of the Parathyroids in Cystic Disease of the Bones. J. A. M. A., 1932, **98**, 1733.

Claude Moore, M.D.

PROGRAM, SOCIETY ACTIVITIES

The Program Committee announces the following program for March:

March 1: "The Bonus Army: Health and Sanitary Problems." Dr. James G. Cumming.

March 8:

1. "Results of Surgical Treatment of Hyperthyroidism." Dr. John deJ. Pemberton, Mayo Clinic, Rochester, Minn.
2. "The Irradiation Treatment of Hyperthyroidism." Dr. George E. Pfahler, University of Pennsylvania.

March 15:

1. "Practical Experiences with Transurethral Resection of the Prostate." Dr. Horatio N. Dorman.
2. "The Modern Treatment of Cancer of the Rectum." Dr. J. Ogle Warfield.

March 22: Conjoint meeting with the Dental Society of the District of Columbia. Dr. Boyd S. Gardner, Head of the Dental Section of The Mayo Clinic, will give the paper of the evening.

March 29:

1. "Recurrent Cancer of the Prostate, Unrelieved by Prostatectomy, Treated by Transurethral Resection: Report of Three Cases." Dr. W. Calhoun Stirling.
2. "Some Observations and Considerations on the Diagnosis and Treatment of Mastoiditis." Dr. Richard A. Kearny.

1933 DUES

Active Members of the Society will pay $15 for the year 1933. Through resolution a rebate is to be made of $5, the dues remaining by constitutional provision $20 per active member. It should be noted that new members who have been out of medical school for a period of less than two years will pay $5; for less than three years, $10. Associate Members receive no rebate. Five dollars will be refunded to all who have paid $20 for 1933.

---

[12] Péhu, M., Policard, A., and Dufourt, A.: Marble Bones and Hypertrophy of the Parathyroids. Presse méd., 1931, **39**, 999.

[13] Bodansky, A., and Jaffe, H. L.: Parathormone Dosage and Serum Calcium and Phosphorus in Experimental Chronic Hyperparathyroidism Leading to Osteitis Fibrosa. J. Exper. Med., 1931, **53**, 591.

[14] Selye, H.: A Condition Simulating Human Scleroderma in Rats Injected with Parathyroid Hormone. J. A. M. A., 1932, **99**, 108.

Dues Now Paid by City Organizations*

CITY	POPULATION	LOCAL DUES	PLUS	STATE DUES	SIZE
Akron, Ohio	346,000	$5.00		$5.00	321
Albany, New York	425,000	3.00		10.00	250
Atlanta, Georgia	370,000	18.00		7.00	403
Boston, Massachusetts	787,000	10.00		Combined	737
Bridgeport, Connecticut	203,000	2.00		8.00	171
Brooklyn, N. Y.	2,560,000	10–25.00		10.00	2,281
Buffalo, N. Y.	820,000	5.00		10.00	812
Camden, N. J.	117,000	5.00		15.00	150
Cincinnati, Ohio	759,000	20.00		5.00	608
Cleveland, Ohio	1,194,000	Sen. 25.00		5.00	1,350
Dayton, Ohio	251,000	Sen. 24.00		5.00	270
Denver, Colorado	287,000	20.00		Combined	565
Des Moines, Iowa	160,000	12.50		10.00	230
Detroit, Mich.	2,104,000	17.50		7.50	1,450
Fort Worth, Texas	174,000	15.00		8.00	202
Hartford, Conn.	164,000	1.00		5.00	400
Houston, Texas	292,000	15.00		8.00	360
Indianapolis, Ind.	417,000	15.00		7.00	508
Jersey City, N. J.	316,000	8.00		12.00	450
Los Angeles, Calif.	2,318,000	12.00		10.00	2,075
Memphis, Tenn.	276,000	6.00		4.00	314
Milwaukee, Wisc.	743,000	Sen. 10.00		15.00	670
Minneapolis, Minn.	464,000	10–20.00		15.00	590
Newark, N. J.	442,000	5.00		15.00	800
New Orleans, La.	494,000	18.00		7.00	480
New York City, N. Y.	10,000,000	8.00		10.00	4,064
Norfolk, Va.	273,000	20.00		5.00	177
Oakland, Calif.	284,000	18.00		10.00	468
Paterson, N. J.	138,000	10.00		10.00	220
Philadelphia, Pa.	2,847,000	20.00		7.50	2,150
Pittsburgh, Pa.	1,953,000	15.00		7.50	1,336
Rochester, N. Y.	398,000	6.00		10.00	490
St. Louis, Mo.	1,293,000	22.00		8.00	1,150
St. Paul, Minn.	271,000	10.00		15.00	285
Salt Lake City, Utah	184,000	5.00		5.00	222
San Antonio, Texas	279,000	25.00		8.00	250
San Francisco, Calif.	637,000	40.00		10.00	822
Seattle, Wash.	420,000	15.00		5.00	542
Spokane, Wash.	128,000	20.00		5.00	165
Toledo, Ohio	290,000	Sen. 35.00		5.00	478
Trenton, N. J.	190,000	20.00		15.00	150
Washington, D. C.†	621,000	20.00		....	815

Average, 42 cities plus state dues,—$23.00.

Average, 12 cities plus state dues,—population 300,000 to 700,000—$23.00.

* Reprinted from The Bulletin of the Chicago Medical Society, December, 1932, No. 27.

† It should be noted that the Medical Society of the District of Columbia operates as a constituent state body. Dues paid include "State" dues.

NOTES

At the recent meeting of the American College of Physicians in Montreal, February 6th to 11th, inclusive, which was the Seventeenth Annual Clinical Session of the College, Dr. William Gerry Morgan was re-elected Secretary-General and Dr. Wallace M. Yater was elected a member of the Board of Governors.

Mr. F. A. Fenning, Society's Counselor, by invitation addressed the Atlantic City County Medical Society on February 10, 1933, in Atlantic City, N. J.

THE GEORGE M. KOBER MEDICAL SOCIETY

The officers of the George M. Kober Medical Society for 1933 are Arnold McNitt, President; Tomas Cajigas, Vice President; Ernest E. Hadley, Secretary; and Herbert H. Schoenfeld, Treasurer. The scientific program for its meeting held on February 20, was as follows:

1. "When Should a Tooth Be Extracted?" Charles L. Smith, D.D.S.
2. "Case Report. Gastric Ulcer in a Child." Howard L. Smith, M.D.

The scientific program for the meeting to be held March 20:

1. "Traumatic Psychoses." Joseph L. Gilbert, M.D.
2. "A Case of Unusual Dilatation of the Stomach." Claude Moore, M.D.

DAVIDSON LECTURER, 1933

The Executive Committee unanimously approved the recommendation of a sub-committee consisting of Drs. William H. Hough, A. B. Bennett and Joseph S. Wall, of Dr. Edwin A. Merritt as lecturer under the terms of the Davidson Foundation. Dr. Merritt, who has long been an associate of Drs. Arthur C. Christie and Thomas A. Groover in the practice of roentgenology, has been doing extensive investigative work concerning the parathyroids in relation to certain diseases of the bone. The address which will be given in the Fall will include results of the Doctor's research.

CHANGES IN MEMBERSHIP STATUS†

Reconsideration was given at the meeting of the Society held January 18, 1933, to the acceptance of the resignation of Dr. Wm. C. Rives. The membership will be gratified in learning that Dr. Rives, who had been a member of the Society since 1907, has withdrawn his request for resignation and is now continued on our rolls with his original seniority number 457.

Changed from Active to Associate Membership:
- Robert T. J. Barber
- William H. Wenger

Resigned from Active Membership:
- H. C. Holm

Resigned from Associate Membership:
- Walter C. Royals
- William O. Wetmore

Dropped, Pursuant to Article V, Section 10 of the Constitution:

Active Members:
- Richmond C. A. Brooks
- Mazarin C. Dollman
- Margaret B. DuBois
- Stewart M. Grayson
- John J. Lynch
- *Emmett E. Newcomer
- Alfred V. Parsons
- Herbert P. Ramsey
- James J. Richardson
- Richard B. Thibadeau
- James R. Tubman

Associate Member:
- Stanton K. Livingston

* Request for reinstatement now in the hands of the Committee of Censors.

We regret to announce the death of the following members:

Lee Ricaud Martin, M.D., Seniority Number 1047. Dr. Martin's active membership in the Society extended from May 31, 1929 to January 31, 1933.

H. Watson Moffitt, M.D., Seniority Number 793. Active Membership extended from April 20, 1921 to January 22, 1933.

Joseph Decatur Rogers, M.D., Seniority Number 342. Dr. Rogers was an active member of the Society from April 27, 1904 to January 12, 1933.

Martin Donahue Delaney, M.D., an Associate Member, whose membership extended from July 10, 1923 to February 10, 1933.

The Woman's Auxiliary to the Medical Society of the District of Columbia has, through death, lost members who were much interested in promoting the cause of organized medicine in this community. It is with sorrow that we record the passing of

Mrs. Wilfred M. Barton
Mrs. Henry C. Macatee
Mrs. Albert L. Stavely

---

† Published pursuant to Article V, Section 12 of the Constitution.

A BEQUEST

The late Dr. and Mrs. Wilfred M. Barton have exhibited their sincere interest in the welfare of the young physician during the trying months of his attempting to establish a practice. The Medical Society of the District of Columbia has been named custodian of residue of estate which, according to the intent expressed, is for the purpose of aiding "young doctors in their first year of practice." Georgetown University School of Medicine is prominently mentioned. "The Barton Fellowship" will serve as an incentive and aid in the production of good scholarship.

DONATION TO LIBRARY

Through the kindness of Dr. L. O. Howard, an honorary member of the Medical Society of the District of Columbia, "THE ACTION OF THE LIVING CELL, EXPERIMENTAL RESEARCH IN BIOLOGY," by Fenton B. Turck, is now available to our readers. Dr. Turck's experimental work is well known. His generalizations give a satisfactory explanation for data derived from studies in "shock" and of many mechanisms of life.

REPRINTS

"Report of a Case of Papillary Carcinoma of the Maxillary Sinus," Annals of Otology, Rhinology and Laryngology, December, 1932, by Joseph Hammond Bryan, M.D.

"Roentgenologic Manifestations of Giant-Cell Tumor," American Journal of Roentgenology and Radium Therapy, August, 1932, by B. R. Kirklin, M.D., Rochester, Minnesota, and Claude Moore, M.D.

"A New Method for Graphically Recording the Contractions of the Parturient Human Uterus," Surgery, Gynecology and Obstetrics, July, 1932, by Samuel Mayer Dodek, M.D.

CONTAGIOUS DISEASE REPORT DECEMBER, 1932

Health Department, District of Columbia

	Morbidity	*Mortality*
Diphtheria	28	3
Scarlet Fever	60	1
Measles	8	0
Whooping Cough	26	1
Chicken Pox	101	0
Typhoid Fever	0	0
Poliomyelitis	0	1
Epidemic Cerebro-Spinal Meningitis	5	2
Smallpox	0	0
Influenza	207	19
Pneumonia (All forms)	236	111
Pellagra	0	0
Encephalitis Lethargica	1	1
Typhus Fever	0	1
Syphilis	385	9
Gonorrhea	200	0
Chancroid	10	0
Tuberculosis (All forms)	80	59

CONTAGIOUS DISEASE REPORT JANUARY, 1933

Health Department, District of Columbia

	Morbidity	*Mortality*
Diphtheria	37	1
Scarlet Fever	86	1
Measles	13	0
Whooping Cough	16	1
Chicken Pox	128	0
Typhoid Fever	1	0
Poliomeylitis	0	0
Epidemic Cerebro-Spinal Meningitis	4	1
Smallpox	0	0
Influenza	45	16
Pneumonia (All forms)	187	92
Pellagra	1	1
Encephalitis Lethargica	0	0
Typhus Fever	0	0
Syphilis	420	17
Gonorrhea	195	0
Chancroid	3	0
Tuberculosis (All forms)	134	53

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS

(*Continued from page 40*)

CONCLUSIONS

1. The diagnosis of congenital hypertrophic pyloric stenosis may be made promptly and with accuracy.

2. The Fredet-Rammstedt operation is simple, curative and permanent in its results.

3. Convalescence is rapid and infants return almost at once to normal development.

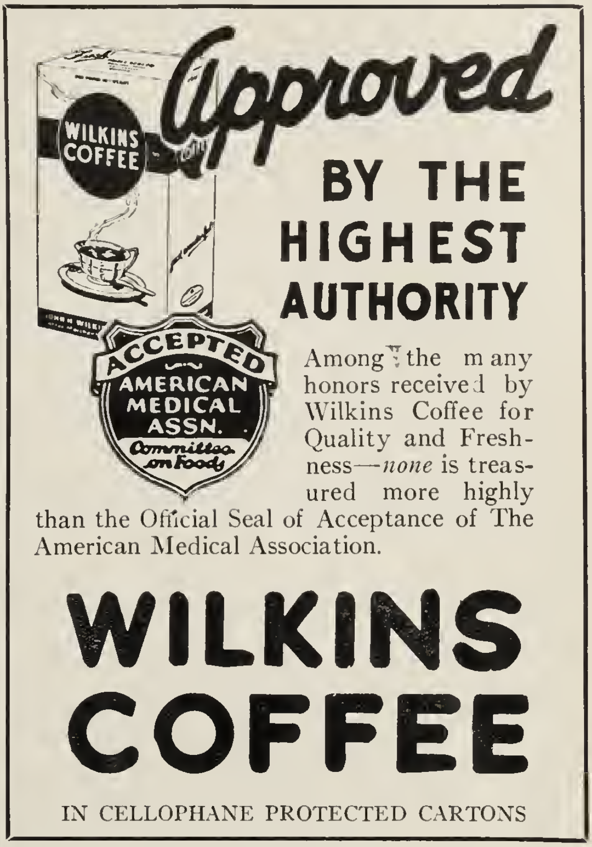
4. In view of the results obtained by surgery in this small series, there appears to me to be very little justification for delay which turns a good operative risk into a bad one.

TRUTH ABOUT MEDICINES

Propaganda for Reform

Dangers of the Injection of Iodized Oils. The Council on Pharmacy and Chemistry reports that it should be emphasized that the injection of iodized oils is essentially a surgical procedure, introducing a foreign and possibly irritant body, and involving more or less risk, which should be weighed against the presumptive advantages, in comparison with the relative advantages and disadvantages of other measures. From the report of the Council it appears that the following cautions should be especially borne in mind: 1. Oils that have aged and darkened beyond their original color should never be used. 2. Subarachnoid injections should be avoided, at least until all other means of diagnosis have been exhausted. 3. Intratracheal and intrapleural injections should be avoided in tuberculosis of the respiratory organs and also when restriction of respiratory area would be contraindicated. 4. The injection pressure should be carefully controlled, so as not to lacerate the tissues. 5. Intra-uterine injections should be made only under fluoroscopic observation. 6. Iodized oil should not be used for renal pyelography, except in the form of emulsion; and the injection should be stopped if pain is felt. 7. Intravascular injections with iodized oil appear too dangerous; the use of emulsions for this purpose requires further study. (Jour. A. M. A., December 3, 1932, p. 1946.)

Deane R. Brengle, M.D. Physicians from Maine to Florida are writing to The Journal sending a four-page advertising prospectus that they have received from Dr. Deane R. Brengle of Dearborn, Mich., in which Dr. Brengle states that he has for sale at the low price of one dollar "Forty Successful Treatments," comprising "A collection unique and valuable." Those who send the dollar receive a little pamphlet containing twenty pages, seventeen of which are devoted to the "Forty Successful Treatments." The prospectus indicates that Dr. Brengle's treatment for bronchial asthma was "discovered by chance;" the one dollar booklet states that it consists in injecting intramuscularly diphtheria antitoxin at intervals and administering, to control the paroxysms, a capsule that "is now available through my chemists, the A. E. Mallard Co. of Detroit." Dr. Brengle's treatment for boils consists in the administration of "Furnol," which apparently is a proprietary remedy also put out by the Mallard Company; his treatment for chorea consists in giving from 8 to 10 injections, intragluteally, of sulpharsphenamine; the treatment for chancroid consists in the intravenous injection of an aqueous solution of antimony and potassium tartrate, with iodoform as a local dressing; the treatment for herpes zoster (shingles) consists in withdrawing a small amount of blood from the patient's arm and immediately reinjecting it deeply into the gluteal muscle; his "specific remedy" for measles is



Approved
BY THE
HIGHEST
AUTHORITY

ACCEPTED
AMERICAN
MEDICAL
ASSN.
Committee on Foods

Among the many honors received by Wilkins Coffee for Quality and Freshness—*none* is treasured more highly than the Official Seal of Acceptance of The American Medical Association.

WILKINS
COFFEE

IN CELLOPHANE PROTECTED CARTONS

SEVEN YEARS' USE
has demonstrated the value of
THE SURGICAL SOLUTION
of
MERCUROCHROME, H. W. & D.
in
PREOPERATIVE SKIN DISINFECTION

This preparation contains 2% Mercurochrome in aqueous-alcohol-acetone solution and has the advantages that:

Application is not painful.
It dries quickly.
The color is due to Mercurochrome and shows how thoroughly this antiseptic agent has been applied.
Stock solutions do not deteriorate

Now available in 4, 8 and 16 oz. bottles and in special bulk package for hospitals.

Literature on request
HYNSON, WESTCOTT & DUNNING, Inc.
BALTIMORE, MARYLAND

amidopyrine; the "treatment of great value" for cancer is a proprietary preparation, allegedly of colloidal gold, exploited by the Kahlenberg Laboratories. Dr. Brengle also advertises that he has a "safe and successful procedure" to induce labor at term. For psoriasis the doctor has "a phenomenal remedy," consisting of the intravenous injection of typhoid-paratyphoid vaccine, followed by the intravenous injection of sodium cacodylate if the vaccine doesn't do the work; his treatment for chronic constipation merely consists in the "regular use of Anti-Constipation granules (Abbott);" for diabetes mellitus, he recommends the use of Trypsogen in connection with the "diet list enclosed" with the preparation; and his treatment for eczema consists of sponging the eczematous areas with a mixture of corrosive sublimate and lime water, later applying ammoniated mercury ointment and giving internally thyroid extract and injecting intragluteally a non-specific protein. Dr. Brengle's collection is neither unique nor valuable. That he should expect physicians to contribute one dollar for his recommendations of unaccepted proprietaries is merely evidence of an extraordinary commercial sense. (Jour. A. M. A., December 3, 1932, p. 1969.)

The Action of Copper in Iron Metabolism. The importance of copper as a supplement to iron for the regeneration of hemoglobin in anemic rats was demonstrated four years ago by Hart, Steenbock, Waddell and Elvehjem. These investigators showed definitely, as Elvehjem and Sherman have recently pointed out, that, in the presence of copper, soluble inorganic iron salts can be used directly for the formation of hemoglobin. Since that time a number of workers have studied factors affecting the production of hemoglobin in rats rendered anemic by whole milk diets. Most of this work has verified the original conclusions concerning the importance of copper; and today nearly all workers agree that copper is an active agent in hemoglobin synthesis. As Elvehjem and Sherman conclude, copper does not affect the assimilation of iron but does function in the conversion of inorganic iron into hemoglobin. In recording these studies it seems desirable to remember that the extent to which the experimental studies are applicable to the human being remains for the most part to be established. Copper is far more widespread in foods than may be commonly supposed. The need for copper is quantitatively far smaller than the requirement of iron. The newer knowledge should not be accepted as a warrant for uncontrolled administration of copper compounds to man. The facts regarding the possible actual needs and function of this element in human physiology remain to be more definitely ascertained. (Jour. A. M. A., December 17, 1932, p. 2114.)

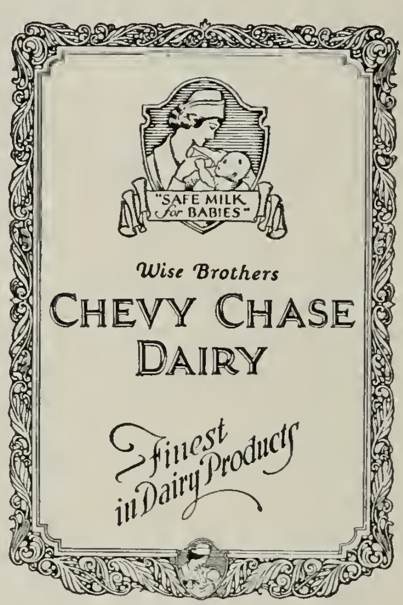
WHITE COATS FOR PHYSICIANS

MERRITT W. ABEL

Representative, The Hoover Manufacturing and Sales Company of New York

We offer to members of the medical profession, COATS and GOWNS of distinction at popular prices. *More* physicians each year are adopting this mode of expressing immaculateness.

Telephone: ADams 0665 5201 Illinois Avenue, N. W.



Wise Brothers

CHEVY CHASE DAIRY

Finest in Dairy Products

'Phone WEST 0183

Authorized by Health Department

CULTURE TUBE
Station

Sputum cups—
Birth Certificates—
Death Certificates—
Biologicals kept under electrical refrigeration

FAST DELIVERY
to All Washington and Nearby Maryland

WHITTLESEY'S
Drug Store

Phone: CLev. 7-7-7-7

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II MARCH, 1933 NUMBER 3

THE ASCHHEIM-ZONDEK TEST IN TERATOMA TESTIS*†

JANVIER W. LINDSAY, M.D.
Washington, D. C.

Since 1899, according to Novak, when Knauer demonstrated that the relationship between the ovary and menstruation, already recognized by Pfluger in 1863, did not depend entirely upon a nervous mechanism, but involved a substance carried in the blood stream, the story of the endocrines, as it bears upon the sexual cycle and pregnancy, has been under construction and revision. The endocrine glands, as is well known, elaborate and deliver into the blood a variety of internal secretions or hormones, which take part in an interplay of stimulation and inhibition of gland and other cellular activities of the most complex order. From time to time means have been devised to isolate certain of the active principles concerned in these processes or to recognize them by their effects. Thus, at least in respect to certain outstanding features, the places of the thyroid, parathyroid, adrenal, pancreas and pituitary, in the endocrine chain have been sharply defined. It is with the "sex hormone" of the pituitary that we are here concerned, a substance or substances, not yet chemically identified nor isolated in anything approaching a simple form, but clearly demonstrated by biological methods.

With the development of this work are associated the names of such men as Evans, Engle and Smith, Allan and Doisy, Brouha, Novak and Aschheim and Zondek.

Experimental implantation of anterior lobe of the pituitary and injections of its extracts in animals have consistently indicated a relationship between the pituitary gland and menstruation, maturation of the ovary and pregnancy. Further studies have demonstrated in the urine, blood and other body fluids, the presence of substances involved in this relationship. From recognition of these facts has been evolved the Aschheim-Zondek test for pregnancy, a procedure considered to be accurate in from 80 to 98 per cent of cases, according to various workers. As stated by Reinhart and Scott, "few if any laboratory procedures are founded on a firmer scientific basis than the Aschheim-Zondek test for pregnancy." A most significant advance took place when it was found that a positive Aschheim-Zondek test was regularly associated with the presence of a tumor of one or other type related to the embryonic tissues concerned in pregnancy, namely, the hydatidiform mole and chorionepithelioma. It is now generally accepted that the study of such tumors is not complete without the proper use of this test and that they cannot be considered to be under control so long as the test remains positive.

The inception and mechanism of the processes involved are far from being completely understood, but their importance seems to me to be clearly implied in the words of Novak, "evidence has been accumulating that the local cycle in the pelvis is associated in the periodic phenomena involving the entire organism. The far flung and profound participation of such distant organs as the pituitary, thyroid and adrenals in themselves justify such a view, even if there were no clinical evidence to justify the belief that a rather profound systemic change takes place at the menstrual period. If this is correct, the menstrual cycle is only a local manifestation of a profound systemic change. How much more strikingly evident is this truth in relation to pregnancy."

---

* Read before the Society, October 26, 1932.

† From the Clinical-Pathological Laboratories, Garfield Memorial Hospital, Washington, D. C.

Likewise, it has come to be believed that evidence is accumulating to show that in our dealings with malignant disease we must concern ourselves, to a greater degree than has been customary, with the profound and widespread disturbances affecting the entire organism, upon the understanding of which, in their relation to the local manifestation, our hope of improvement in diagnosis and therapy may largely depend.

In April 1932, Ferguson of the Memorial Hospital, New York City, discussed the application of the Aschheim-Zondek test to the study of testicular tumors. It is not my intention to enlarge upon the subject which he considered at that time, but it is my hope that by a brief presentation of several cases in which I followed the procedure outlined by him, I may help to fix the impression which he created and so, in some degree, advance what appears to me to be one of the most significant movements in cancer research yet undertaken. This work represents a startling and closely coördinated transition from the field of the natural processes, namely pregnancy, to that of the clearly abnormal, namely the malignant tumors developing from the embryonic structures related to the appearance and growth of the fetus.

It is of interest that while the conception of the endocrines has assumed more and more of practical value and while attention has been focused on the significance of the tissues entering into the development and course of pregnancy, the rapid and massive hyperplasia of these structures and their return to their previous state or disappearance from the clinical picture in accordance with fixed natural laws, this means of studying the rapid and unrestricted growth of malignant tumors has reached its present stage. It is undoubtedly of far-reaching importance that these two, heretofore separate, lines of investigation have met in the work now under discussion.

The Aschheim-Zondek test constitutes the first, possibly the only, strictly diagnostic procedure available for the recognition of the presence of malignant disease before it may be observed directly by the eye or detected by the roentgen ray. Likewise, it is the only means at our command for determining the course of such disease, except by similar methods of direct or indirect observation. I have already indicated that other evidence of the importance of general conditions in relation to malignant disease and its control is accumulating, and it is gratifying to be permitted to refer to the significant observations of Drs. Groover, Christie and Merritt and their associates in this field. The burden of all our campaigns looking to the control of cancer has been the plea for early recognition and immediate treatment. The biological test, as now available, gives a new meaning to the term "early," at least in special groups of neoplasms, and may well stimulate hope for better therapeutic results in its proper field than have been possible heretofore.

I shall not cite in detail the technic of the special application to the type of condition here reported, namely, teratoma testis, since these are readily available in the numerous original articles. Aschheim and Zondek, following Zondek's observation in 1929 of the appearance of the sex hormone of the pituitary in the urine of a man with teratoma testis, were able to produce consistently positive tests by the injection of urine from several cases into immature white mice. While it has been the general rule to use female mice in the biological test for pregnancy and later also for the test for teratoma, it is significant that Brouha and his associates preferred to use male mice, basing their conclusions on the gross reaction in the genital tract. This fact, with the response of the ovaries of the injected animals to the urine of the patient with testicular tumor, falls logically in with the reality of the development of the individual of either sex, from a single cell, and the presence in the body of either sex of rudimentary tissues corresponding to those reaching more complete differentiation in the opposite sex. In teratoma of the testis, the substance stimulating the pituitary reaction is developed in sufficient quantity to be detected by the Aschheim-Zondek test, when it is performed under proper conditions. In the normal male none of the activating substance is demonstrable by this means. In teratoma testis, again, the amount is so small that, with few exceptions, it will not be detected unless the urine is concentrated before injection. The method of concentrating the urine is similar to that suggested by others, including Aschheim and Zondek, and Silverberg and Eberson, but, inasmuch as Ferguson has adjusted his procedure so as to establish a quantitative test and has employed it in a relatively large number of cases, it is urged that the rules he has laid down be carefully followed. In this way, not only will it be possible to make the diagnosis of teratoma, but the grade of malignancy in terms corresponding to the already familiar histological classification may be estimated.

As Ferguson stated in his presentation referred to above, there had been reported, in April 1932, only 27 cases of teratoma testis studied by the Aschheim-Zondek test. He then reported 83 additional cases. My own work as I have indicated, is very limited, and is reported merely as illustrating and, I believe, corroborating that which has already been carried on by others. Circumstances have made it impossible to follow these cases as satisfactorily as I would like and as completely as I hope to study other patients in the future.

REPORT OF CASES

Case 1: The patient reported to Dr. Hagner in March, 1926, with a painless, testicular tumor of several months duration. The testicle, with the tumor, was removed at this time. Diagnosis on microscopic examination was "malignant," probably round-cell sarcoma. In May, the patient returned to Dr. Hagner and was referred to Dr. Groover, at that time having marked enlargement of the cervical lymph glands. X-ray study showed a condition interpreted as a definite malignant infiltration of the upper portion of the lung. Following roentgen therapy the glandular enlargement disappeared and the lung fields returned to normal. Also, there was notable change in the general condition of the patient, which had lately been much below his usual standard. Further study of the sections of the original tumor has lead us to classify it as embryonic carcinoma. In October, 1932, the patient returned for examination, and a large, firm, well defined mass in the upper part of the abdomen was found. This mass was in close proximity to the liver, but apparently not attached to it. It seemed to be fixed posteriorly. The conclusion of all observers was that the abdominal mass, like the pulmonary infiltration and the lesion in the cervical glands, represented recurrences of the testicular tumor. The tumor of the abdomen had practically disappeared when the patient was seen about December 20, 1932, following a course of x-ray therapy.

The reports of the Aschheim-Zondek tests are as follows:

1. May, 1932. Definitely positive (Microscopic).
2. June, 1932. Definitely positive (Microscopic).
3. October, 1932. Definitely positive (Microscopic). (Two tests).

December, 1932. Definitely positive. (Two tests.)

The intensity of the reaction varied, we felt, quite definitely in correspondence with the clinical condition, the test in June, at a time when there was clinical improvement following x-ray therapy, being less strongly positive than that made at the examination the previous month. Similarly, the second test in December, made several weeks after the first in that month, and after a course of radiation, was less intense than the first.

Case 2: The patient, a white man, aged 32 years, was admitted on July 18, 1932, with complaint of tumor of the testicle. About one year before a small "growth" had been noticed in the left scrotum. It had enlarged to the size of a "fist." It had been thought to be a hernia and a "support" was used. Because ot a history of lues and a positive Wassermann a course of antiluetic treatment was instituted, which, however, was unsatisfactory because of lack of coöperation on the part of the patient. As the improvement was not as marked as anticipated, it was felt that the possibility of tumor, always kept in mind, was even more likely than had appeared at first. The Aschheim-Zondek test was performed and gave a definitely positive result. The tumor was excised, July 18, 1932. The gross appearance as shown in microscopic examination revealed epithelial structures varying from well differentiated tubules to smaller, irregular, infiltrating islands and groups. The impression was of a rather adult type, though with areas suggesting a more rapidly developing tumor. This patient left the hospital and the city, taking up his residence at his old home in the North. Reports of general metastasis were received within a few weeks, and the patient died in October, 1932. A request was made for a specimen of urine, so that the Aschheim-Zondek test might be repeated. However, no specimen was sent, and a report of a negative test performed near the patient's home was given. While we have been unable to learn the technic employed, it is our impression that the usual procedure as in relation to pregnancy was adopted. No necropsy was obtained, but the description of the case indicated practically certainly a widespread metastatic growth.

Case 3: The patient, a white man, aged 41 years, was admitted on August 30, 1932, with the complaint of enlarged right testicle of one year's duration. A soft swelling of the testicle had been present for several years, following herniotomy. Apparently it was a hydrocele which was aspirated once, but refilled. During the past year it became absolutely hard. The conclusion from general examination, transillumination and aspiration was that it was probably a testicular tumor. The Aschheim-Zondek test (two tests) was reported as probably positive on the basis of a single somewhat enlarged ovarian follicle containing a few red cells, in each series of sections. The surgeon was requested to examine the testicle before excision as the test seemed hardly conclusive. At operation an enormously thickened hydrocele sac was found, with atrophied testicle. The testicle and sac were removed, it being concluded that the former was completely atrophied and functionless. My feeling, in view of this case, would be that such a test should be interpreted as negative, or at least doubtful, and would indicate special caution in determining the extent of operative procedure.

CONCLUSIONS

The term "early" in its application to the diagnosis and treatment of malignant disease is given a new significance by the appropriate use of the Aschheim-Zondek test. The application of the Aschheim-Zondek test to the study of malignant disease, including teratoma testis, sets apart another group of tumors which may be followed by graphic methods. I believe that this delineation of special groups amenable to special methods of diagnosis and control constitutes the most important phase of the attack upon the cancer problem while we await improvements in the recognized procedures already available. A most important factor in the value of the Aschheim-Zondek test is its clear demonstration of significant general principles in relation to the local manifestations of cancer with which we have so long been familiar. The evidence resulting from the work so far accomplished in connection with the Aschheim-Zondek test appears to offer a most hopeful outlook for the development of other biological procedures which may broaden the field of precisely studied neoplasms and lay the foundation for further improvement in both diagnosis and therapy.

N.B.: I wish especially to acknowledge the encouragement of Dr. Ferguson of the Memorial Hospital and his kindness in examining sections in the first two cases reported.

BIBLIOGRAPHY

Aschheim, S.: Early Diagnosis of Pregnancy, Chorionepthelioma and Hydatidiform Mole by Aschheim-Zondek Test. Am. J. Obst. & Gynec., 1930, **19**, 335.

Brouha, L., and Hinglais, H.: Le diagnostic de la grossesse par la reaction de Brouha-Hinglais-Simmonnet. Gynéc. et obst., 1931, **24**, 42.

Doisy, E. A., Thayer, S., and Valer, C. D.: Preparation of Crystalline Ovarian Hormone from Urine of Pregnant Women. J. Biol. Chem., 1930, **86**, 499; Am. J. Physiol., 1929, **90**, 329; J. A. M. A., 1923, **81**, 819.

Eberson, F., and Silverberg, M. H.: Anterior Pituitary Hormone in Urine; Rapid Method for Diagnosis of Early Pregnancy (Study of 175 Consecutive Cases). J. A. M. A., 1931, **96**, 2176.

Evans, H. M., and Long, J. A.: Anat. Record., 1921, **21**, 62.

Ferguson, R. S., Downes, H. R., Ellis, E., and Nicholson, M. E.: Preliminary Note on a New Method of Differentiating the Testicular Tumors by Biological Means. Am. J. Cancer, 1931, **15**, 835.

Groover, T. A., Christie, A. C., and Merritt, E. A.: Personal Observation and Communications.

Novak, E.: Biologic Significance of Female Reproductive Cycle. J. A. M. A., 1931, **96**, 2173.

Reinhart, H. L., and Scott, E.: Modification of Aschheim-Zondek Test for Pregnancy. J. A. M. A., 1931, **96**, 1565.

Smith, P. E., and Engle, E. T.: Experimental Evidence Regarding Rôle of Anterior Pituitary in Development and Regulation of Genital System. Am. J. Anat., 1927, **40**, 159.

INADEQUATE SEXUAL FUNCTION IN THE MALE*

Walter R. Stokes, M.D.

Washington, D. C.

It is surely no exaggeration to state that among civilized humanity inadequate male sexual performance is one of the very prevalent causes of the most poignant misery and unhappiness. Seldom does a physician hear any complaint so tinged with bitterness and despair as that of the patient reporting insufficient sexual function. Equally distressing may be the story told by the wife of such a man. The psychology of this unhappiness is not difficult to comprehend. Virtually every human being visualizes a love ideal in which perfect sexual union is an essential element. In addition, the idea is mistakenly but none the less widely prevalent that sexual impotence necessarily implies ruinous impairment of every virile quality of the personality. Thus, severe sexual inadequacy is quite certain to disrupt the entire love theme, bringing to the man humiliation, disillusionment and feelings of deepest inferiority, and to the responsive woman a bitter and perhaps unendurable disappointment. The ultimate result is frequently neurosis added upon neurosis until the integrity of the personality is seriously disturbed. Only the occasional exceptionally well sublimated individual is able under such circumstances philosophically to resign the sexual life without apparent personality damage.

---

* Read before the Society, January 25, 1933.

To my review of the seriousness of inadequate sexual performance I would add a word upon its incidence. While specific figures are almost impossibly difficult to obtain there can be no doubt that the incidence is high, probably at least 10 per cent of the entire adult male population of this country. In this estimate I refer only to those cases in which the difficulty is so pronounced as to cause acute dissatisfaction. Some degree of impairment of potency is the rule in our present civilization. The fully, consistently potent man is the exception, for reasons which I shall state presently.

One should not fail to consider that the number of men who are driven to seek aid because of impotence is considerably reduced because of the fact that so many women are sexually frigid and therefore do not complain of the impotence of their husbands. It is important to observe that the same general factors which I shall describe as leading to impotence in men are even more active and effective in causing frigidity in women; and women are of course subject to powerful frigidity-inducing factors peculiar to their sex, so that in the net result frigidity in women is at least 3 or 4 times as prevalent as impotence in men.

In order to insure a clear concept of the precise nature of the disorder I am discussing, I wish at the beginning to establish a working definition. I shall assume the term "male sexual inadequacy" to include any inability to secure erection, by ejaculation before intromission, by inadequately brief intravaginal voluptas, by exceptional difficulty in reaching ejaculation, or by the requirement of an unusually long recovery period following ejaculation.

Certain of the elements in this definition demand further explanation. For present purposes the terms "ejaculation" and "orgasm" may be regarded as synonymous. By erection is meant a full erection capable of being maintained at intromission. By inadequately brief intravaginal voluptas is meant an unsatisfactory shortening of the time elapsing between intromission and orgasm. Here no precise time can be assigned, but certainly if this phase is repeatedly under 1 or 2 minutes and is invariably followed by prolonged loss of erection there can be no hesitancy in concluding that inadequate function exists, for few normally responsive women could possibly be brought to detumescence through such a performance. As an actual, practical fact, the adequacy of the intravaginal voluptas must always be estimated with reference to the specific needs of the sexual partner. If a man is able to prolong this phase for 15 minutes while his wife demands 20 his performance is inadequate in so far as she is concerned unless he has a sustained or promptly revived erection.

In my definition is mentioned exceptional difficulty in reaching ejaculation despite satisfactory erection. The individual displaying this phenomenon is likely to enjoy a somewhat false reputation as a sexual paragon, for he can of course provide an extraordinary amount of vaginal stimulation even if his own orgasm is never attained and his satisfaction slight.

The final phase of my general definition deals with the requirement of an unusually long recovery period following ejaculation. Poor libidinous rebound is characteristic of virtually every type of impotent behavior, but I am making a special case of the individual who reaches a first orgasm in an apparently adequate manner only to lose all ability to regain erection under continued stimulation. The specification of any normal rebound time is impossible, although it should be a matter of minutes rather than of hours or days. The most vital factor in its estimation is the corresponding demand of the sexual partner for further stimulation.

As an introduction to the etiologic study of these disorders that have been defined I wish to

BOSTON MEDICAL

present an interpretation of the relatively normal sexual performance. For this purpose I shall assume the sexual contact of an experienced, fully potent man with an experienced, responsive woman, under ideal emotional and environmental circumstances. I have chosen in this situation to depict the man's performance in a graphic chart (Figure 1).

Here the most significant observations are: (1) Good erection well maintained, (2) satisfactory prolongation of the intravaginal period of the voluptas, (3) an excellent rebound after orgasm, decreasing progressively after each successive ejaculation, (4) a voluptas constantly positive, with no swing to the negative side of abhorrence and disgust.

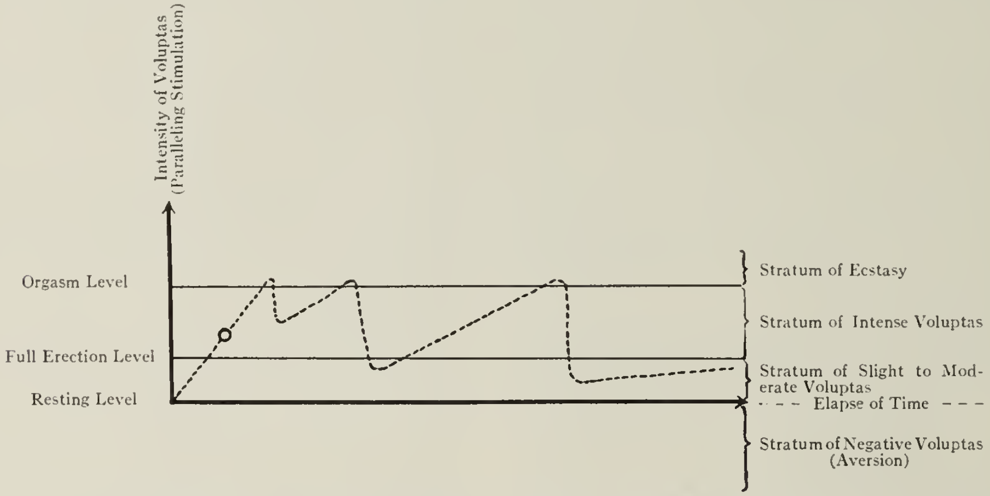


Fig. 1. Graphic Representation of Unimpaired Male Sexual Performance (under Ideal Conditions)

Graphic line = libidinous progress. ○ = intromission

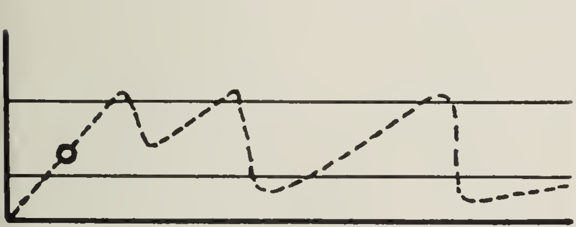
Next I present a series of graphs (Figure 2) delineating the various types of inadequate performance that have been mentioned. Graph No. 2 of this figure illustrates the libidinous behavior of the individual who cannot command an adequate erection. Graph No. 3 deals with ejaculation before intromission. Graph No. 4 concerns inadequately brief intravaginal voluptas. Graph No. 5 represents involuntarily excessive prolongation of the intravaginal voluptas. Graph No. 6 indicates the performance that is relatively normal except for a deficiency of libidinous rebound.

As one reviews these graphs it is seen that all of the various inadequate performances have two common factors: an insufficient libidinous drive and a terminal swing to a negative voluptas or reaction of disgust and aversion. These observations suggest a key to the entire situation. One naturally wonders how it can be possible for such an enormously powerful biologic endowment as the libido to fail so dismally. The following causes suggest themselves: (1) An hereditarily weak libido, (2) functional weakening due to local or remote organic pathology, (3) a requirement of some lacking or different stimulus, (4) the presence of libido-crushing fear.

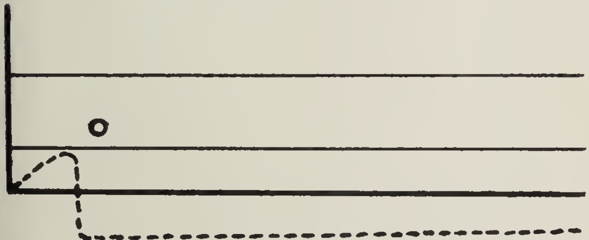
The first of these four factors may be dismissed as of little importance. Undeniably there is a certain hereditary variable in the potency equation, but even the lesser grades of hereditary libido endowment are amply sufficient to insure good sexual function if given a reasonable chance at natural development. Positive evidence of this occurs in the fact that serious lack of potency is unknown among primitive orders of man who follow a simple biologic pattern in the sexual life.

The second factor, that of local or remote organic pathology, must always be given careful consideration but is shown by experience to account for only an insignificant percentage of all cases encountered.

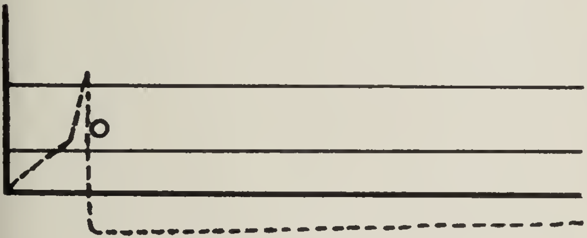
The answer to our question is contained in the third and fourth factors mentioned; that is, to a requirement of a lacking or different stimulus or to the presence of libido-crushing fear. These potency destroyers are largely or wholly a product of civilized ideals and morals. Just as surely as civilization has in many ways expanded and enriched the erotic life, so has it impeded its expression in other ways, chief among which are: (1) The frequent association of libidinous expression with requirements impossible of realization, (2) the creation of a dominating fixation upon some sexual component other than the heterosexual, (3) the association of sexual expression with fear and danger, typically through the doctrine that sex is sin.



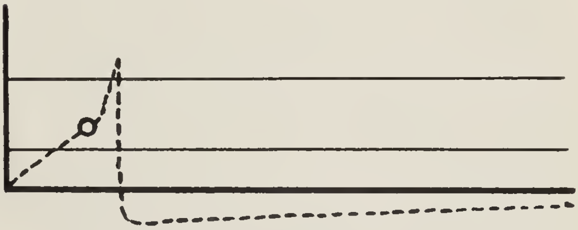
1. Unimpaired Performance



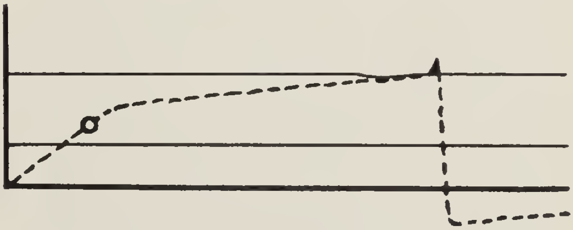
2. Inadequate Erection



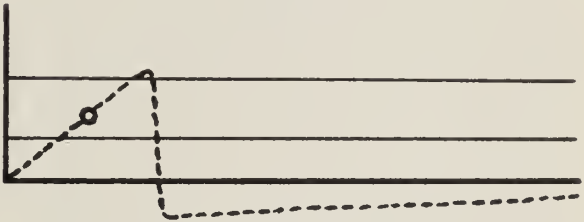
3. Ejaculation Before Intromission



4. Inadequately Brief Intra-vaginal Voluptas



5. Excessively and Involuntarily Prolonged Intra-vaginal Voluptas



6. Simple Deficiency of Rebound

Fig. 2

Working from this general viewpoint of the etiology of impotence one knows how to proceed in explaining that weakened drive seen in every case. Always the libido must be doing one of two things: straining in another direction in protest against inadequate present stimulus, or struggling with fear. Thus it is unable to soar freely and naturally in response to the proffered stimulation, for it is forced to drag along a dead weight of aversion or of fear. And once the present stimulus has exerted its maximum lifting effect the libido is overwhelmed by its burden, hurtling downward not only to the resting or neutral level but crashing beneath it to the negatively toned stratum of disgust and abhorrence, where it is further firmly anchored by the added weight of an inrushing sense of failure and humiliation.

Having in this way visualized the etiology of insufficient sexual function there should be no hesitancy as to the therapy. Certainly it must not be the traditional passage of sounds, prostatic massage, and the instillation of caustics, all accompanied by sad lamentations over fancied past sexual abuses. In any but the rarest case psychotherapy is demanded. This usually comprises a combination of analysis, suggestion, and emotional and environmental readjustment. In many cases complete relief is afforded easily by a superficial analysis. In others it results only after a profound study of the patient's subconscious life, for often he is quite unaware of the existence of trouble-making complexes that lie deeply buried in the subconscious realm of his mind.

The prognosis is ordinarily excellent with younger men and is less bright as age advances. A large percentage of all cases respond perfectly to treatment. Others gain only partial improvement, and a few are incurable because of the practical impossibility of altering certain factors in the personality or in the environment.

Generally speaking, it is conservative to state that inadequate sexual performance has, by the application of psychotherapeutic methods, become a truly remediable condition as contrasted with its former gloomy prognosis. This great improvement in the prognosis is of course founded upon that accurately determined etiology which is the contribution of psychoanalysis.

I appreciate that this paper has accomplished nothing more than a bold outline of the subject, leaving many interesting phases untouched, yet my purpose has been fulfilled if I have succeeded merely in giving a simple exposition of the essential values of the newer method of approach to a subject traditionally steeped in hopeless supersitition and ignorance.

Discussion was participated in by **Major James C. Kimbrough, Drs. R. Arthur Hooe, Francis R. Hagner** and **Benjamin Karpman.**

THE TECHNIC OF INTRAVENOUS INJECTIONS*†

Maurice Arthur Selinger, M.D.
Washington, D. C.

We have just listened with great interest to the value and indications of intravenous injections in internal medicine, in pediatrics and in surgery, and, to conclude this symposium, it is my privilege to set forth the technic of this form of therapy in the hope that the maximum benefit will be obtained by its employment. Hunt and his collaborators of The Special Committee appointed by the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association, under the caption of Technic, says: "The matter of technic is of paramount importance, and many of the disturbing reactions and dangers of this form of therapy can be minimized by proper attention to details."

In order to cover the subject in the space of time allotted, it will of course be possible only to touch upon the most important points. To do this as comprehensively as is consistent with brevity, I have included the following types of intravenous injections in this discussion which, taken as a whole, will give a general idea of our concepts of the factors to be considered in the use of intravenous treatment: (1) Transfusion of blood, (2) injections having for their chief purpose the supplying of fluids to the body, and (3) injection of actual therapeutic agents or chemicals. Since transfusion of blood requires special consideration, I shall make several points about this procedure at the conclusion of the discussion of intravenous injections in general.

The care and preparation of the apparatus to be used deserves primary consideration, and its importance cannot be too strongly emphasized. It must be chemically as well as surgically clean, for it requires but the smallest amount of foreign protein to produce unpleasant reactions. Glassware may be sterilized in an autoclave at 20 pounds pressure for 30 minutes, or in a hot air oven at 150°C. for 1 hour. Rubber tubing will not stand this treatment very well, so it is our practice to sterilize it by boiling in distilled water for 10 minutes just before it is used. When the apparatus is assembled, its interior is thoroughly rinsed with freshly prepared, triple-distilled water or sterile physiological salt solution before it is used. The needles, the length and gauge of which naturally depends upon the type of injection, the site of injection and the density of the substance to be injected, may be sterilized by boiling in water for 1 minute and then be kept in 95 per cent alcohol until ready to be used. A very sharp needle is the greatest asset to its successful introduction into a vein, and the unsuccessful operator is usually the one who pays little or no attention to this factor. When one uses alcohol as a means for transporting needles, great care must be exercised to be sure that the alcohol has been completely removed by thorough washing before the needle is introduced into the vein. It probably seems superfluous to mention the necessity for being certain that the needle is not plugged in any part of its length, but one so frequently sees this condition occur that the point is emphasized at this time. The entire apparatus should be cleaned immediately after its use because once dried blood or other substances have become adherent to the rubber tubing, they may never be satisfactorily removed. The preparation of the solution to be used is equally as important. It has long been an established fact that only freshly prepared distilled water should be used as the vehicle for substances to be given intravenously. Those exercising the greatest care in the preparation of solutions for intravenous use, use triple-distilled water. Since this is not readily obtainable, we recommend that which is prepared and marketed in ampules by the several reliable biological concerns. Their facilities for the preparation of standard percentages of glucose solutions and other chemicals are so far superior to those of the individual that, in spite of the small additional cost, the merits of their products warrant their use. All solutions, with few exceptions, should be injected at approximately body temperature. Some prefer to heat the solution to the proper temperature and keep it in a heated container, while others allow the cool solution to run through a rubber tube surrounded by hot water bags, an electric pad, or some other such contrivance.

---

* Read before the Society, November 9, 1932, as part of a symposium on the subject of intravenous therapy.

† From the Clinical-Pathological Laboratories, Garfield Memorial Hospital.

The rate of flow of any substance into the vein is a subject about which much has been written. In November, 1929, Keith wrote: "The rate of injection of intravenous solutions is often too rapid: from 30–40 cc. each minute is a satisfactory rate of flow when a considerable amount of fluid is being injected." There are many of us, I am sure, who feel that even the rate of flow indicated above is far too rapid. Hirshfeld, Hyman and Wanger, in the report of their admirable work in intravenous therapy in what they call "speed shock" say that reactions depend on the velocity or rate of flow of substance into the circulation, and not upon the nature of the substance used, its concentration, etc. They demonstrated that the primary disturbance probably occurs in the liver cell, where "as a result of the temporary cell damage, some potent or labile substance is liberated or escapes destruction by the liver, and this substance is responsible for the symptoms described." Two weeks ago there was presented before this Society a modification of a new device originated by Brush for continuous infusion in infants. He claims for his apparatus control of flow and temperature of the fluid, stable connection with the vein by the insertion and fixation of a piece of ureteral catheter, and the prevention of back flow. The operation of this apparatus has been continued without interruption for more than 3 days. I am not prepared at the present time to agree fully to the use of this type of apparatus, nor am I convinced that any type that I have seen will overcome all the objections to this method of therapy. Although overwhelmingly in favor of slowness in all forms of intravenous injections, I feel that with the introduction of the continuous flow a number of new factors have been advanced, a more complete understanding of which is desirable or essential.

The selection of the site to be used for the injection may be considered at this point. Obviously this will be governed to a certain extent by the age of the patient and the circumstances involved. Under ordinary conditions one of the veins in the antecubital fossa of the forearm is the site of choice. In those instances when intravenous injections are given simultaneously with operations upon the upper portions of the body, it is advisable to select a vein of the lower extremity. There are several veins of satisfactory dimension to be found on the foot and around the ankle, and by the utilization of one of these the operator is not likely to interfere with or to be interfered by, the surgeon. One must remember, however, that it usually requires greater force to carry on the flow of fluids in anesthetized patients; and the extra pressure needed is in direct proportion to the distance of the point of entry from the heart. In the case of infants and children, superficial veins of the scalp are frequently found suitable for use, and when these are not available, the external jugular vein may be used with much difficulty. The femoral vein in infants has been recommended as a suitable site for intravenous injections and can be more or less easily located because of its proximity to the femoral artery. However, since this vein can neither be seen nor felt, it should be used only when other means of entry have failed, even though the possibilities of producing complications by subcutaneous infiltration are rather slight unless irritating solutions are employed. The use of the longitudinal sinus for intravenous therapy should rarely if ever be resorted to. In spite of the many safeguards established for it, the chances for extravascular leakage are manifold and the potential dangers too great. A vein to be used in any locality is better if visible, but at least it should be palpable.

One is frequently confronted with the question of the amount of blood or solution to inject at one time. It is of course obviously impossible to set down any exact rule which will apply correctly to each patient, for one must at all times be guided by the individual circumstances, such as the age of the patient, the state of the circulation, and the pathological condition for which the procedure is undertaken. Even when a predetermined amount is decided upon, it is not always possible to give the full quantity because of warning symptoms which may occur at any time and indicate the expediency of terminating the injection. The operator must be constantly on the alert to detect these symptoms, some of which are objective, others purely subjective. Among the latter, one must attempt to differentiate between true effects of the injection and nervous influences. In the case of blood transfusion, much study has been devoted to the amount to be transfused at one time as well as to the frequency of repetition. Here again the decision will be determined by individual circumstances. In my opinion, which is not based entirely upon my own experience, small transfusions of a maximum of 300 cc. of blood at one time have a better effect upon the hemopoietic system than larger amounts, and are, besides, better tolerated by the patient. There is little tangible evidence in the literature to indicate the frequency with which these transfusions should be repeated; but, as a general rule, an interval of 2 days will probably produce the best results. When transfusions are done to replace blood lost by means of surgical or traumatic hemorrhage, these rules do not become operative, and the indications are to replace in the shortest time sufficient fluids and blood to maintain the circulation.

The subject of the technic of blood transfusions may well be considered to include the selection of and typing of the donor, the matching of the donor and the recipient and a number of other closely related factors, but time and the scope of this symposium prohibit their discussion.

This brings us down to the actual performance of the procedure, and we suddenly find ourselves facing two sharply defined lines of thought. Shall we do the direct transfusion of whole, unmodified blood, or shall we do the indirect transfusion of modified whole blood? The perennial argument about the superiority of the use of unmodified blood over blood to which sodium citrate has been added as an anticoagulant continues unabated. Unger's claims, that citration develops anticomplementary substances, increases red-cell fragility, lowers opsonic index and diminishes the phagocytic power of the leukocytes, have many equally authentic challengers, among whom may be mentioned Mellon, Hasting and Casey. The opinions of the host of writers and investigators on this subject are so evenly divided that when the additional weight of the technical difficulties involved in the injection of whole blood is thrown into the scale against the citrated blood, the balance seems to swing in favor of the latter. That dissatisfaction exists with the use of the whole-blood method may be indicated by the large number of different forms of apparatus which have been devised for its faultless accomplishment. The whole-blood transfusion is more spectacular, but I am not convinced that this adds anything of benefit to the patient. The use of the direct method requires a rapid rate of flow; the use of the indirect method allows a slow rate of flow. All that has been mentioned above about the preparation of apparatus for use in intravenous therapy applies, of course, with equal force for transfusion of blood.

In indirect transfusions, gravity is used as the propelling force, and the rate of flow of the blood is readily controlled by the height at which the container of blood is held. The blood should be given to the recipient as soon after its withdrawal from the donor as is practicable. Although there may be no evidence that blood kept under proper conditions for a day or two, or even longer, will prove harmful, yet it is, on the other hand, only logical to suppose that some of its useful qualities may grow less potent as the interval between withdrawal and injection lengthens.

BIBLIOGRAPHY

Brush, J. M.: Method for Continuous Infusions of Infants. Am. J. Dis. Child., 1932, **44**, 366.

Hirshfeld, S., Hyman, H. T., and Wanger, J. J.: Influence of Velocity on Response to Intravenous Injections. Arch. Int. Med., 1931, **47**, 259.

Hunt, R., et al.: The Status of Intravenous Therapy. J. A. M. A., 1927, **88**, 1798.

Keith, N. M.: Intravenous Medication; Physiologic Principles and Therapeutic Applications. J. A. M. A., 1929, **93**, 1517.

Mellon, R. R., et al.: Effects of Sodium Citrate on Blood. J. A. M. A., 1922, **79**, 1678.

Unger, L. J.: The Deleterious Effect of Sodium Citrate Employed in Blood Transfusions. J. A. M. A., 1921, **77**, 2107.

DISCUSSION*

Dr. Janvier W. Lindsay: Intravenous injections should be given with a full knowledge of the conditions for which they are given. Enough has been said of the dangers which may attend these injections. It is important that the clinician and the one giving the injection maintain a close coöperation in order that the treatment may best meet the conditions. One of our patients was given 4 transfusions, all from the same donor; she had a typical asthmatic attack immediately after the last transfusion, an example of the unexpected that may occur. The question of salt solution in intestinal obstruction is important. It is not always attended to as early as it might be. Determination of the blood chloride will indicate the amount and concentration of solution to be used, whether normal or hypertoxic. As to glucose, I believe this solution should never be used intravenously without first determining the carbohydrate content of the blood. The subject of continuous intravenous injection is interesting and important. Question of speed is settled; it should be 3 to 5 cc. per minute. At that rate one may readily inject 3000 cc. of 10 per cent glucose in 24 hours, alternating with salt solution as desired, and thus provide about 1200 calories per day. Concerning food value of blood transfusions, it should be borne in mind that there are only about 140 calories per pint of blood, which is not a large amount of nourishment. If one is depending upon blood alone, he must consider the food value of the amount being given. I think it well to emphasize the use of Hartman's solution, one which may be used in either acidosis or alkalosis. It is a very carefully worked out solution which may be used, especially in an emergency, to assure a normal "reaction" of the blood. I would like to ask a question as to the use of blood transfusion in gas poisoning. A committee which investigated this subject was opposed to the idea of transfusion in this condition.

Dr. John Minor: This is a very interesting, well presented and important symposium, but, on further consideration, it is important to remember that while many transfusions are done needlessly, it is perfectly possible to establish satisfactory criteria for their use or omission in almost every case, and that this measure, so important when indicated, should be used promptly and without hesitation when such indications are present. We do see many transfusions given for vague indications (such as toxemia, debility, and the like), or even because the family desired that something should be done. I am particularly interested in the use of glucose, which I consider one of the most important additions to our therapeutic armamentarium. I would also call your special attention to the points mentioned by all the essayists regarding the care necessary in the preparation of solutions, and to the detailed technic of administration. I am in entire agreement with the standards that Dr. Selinger suggests for them. Each hospital now uses a different method. All hospitals should follow Dr. Selinger's standards closely in the preparation of the solution. Reliable chemicals and properly distilled water are the most important requirements. Solutions given intravenously, which we all might have occasion to use and which are sometimes necessary as life-saving measures, should be prepared in a uniform manner and held to rigid standards, since without these precautions, severe and often dangerous reactions may occur in patients already desperately ill. The man doing intravenous therapy constantly can control his own solutions, but any solution used as generally as glucose is, should, for the above reasons, be available in safe form, at least at all the hospitals. There are two or three interesting indications for the use of glucose: Cirrhosis of the liver; the toxemic states, of which it is the only measure which holds any theoretical or practical hope of benefit; occasionally circulatory collapse not due to circulatory disease; and suppression of urine in nephritis.

---

* Discussion of papers delivered before the Society in a symposium on the subject of intravenous therapy.

Dr. J. Bay Jacobs: This has been an interesting symposium on a therapeutic and emergency procedure of great value in all branches of medicine. I dare say that its position in the armamentarium of the obstetrician is such as to warrant no small mention. This is evidenced when we consider briefly obstetrical indications for transfusion. In the early months of pregnancy abortion may be accompanied by hemorrhage or infection. Hemorrhage unaccompanied by infection may be treated rapidly and efficiently by citrate transfusion. When infection is present, although the citrate transfusion is beneficial, opinion is unanimous that the direct transfusion is the procedure of choice, because of the advantages claimed for unmodified blood. Reactions are rare, the red cells and platelets are not altered, the phagocytic power of the white cells is not destroyed and the available quantity of complement is not diminished. For these reasons direct transfusion offers the most promising results of any therapeutic measure in the treatment of puerperal infection. It is interesting to note that this method of treatment does not cause an immediate drop in temperature; but usually about 24 hours later the patient looks better, feels stronger and has a better appetite. About 3 days after transfusion, the temperature falls about 2 degrees and then gradually returns to normal. In some cases transfusion must be repeated. Transfusion probably finds its greatest indication in the hemorrhages of pregnancy and labor. In placenta previa, ablatio placentae, ruptured uterus and postpartum hemorrhage, transfusion often serves to keep the patient alive during the course of treatment. Polak, shortly before his death, advocated direct transfusion in the treatment of hyperemesis gravidarum. Some men have used immunized serum to combat hepatic eclampsia. This appears logical, for we know that hepatic eclampsia confers immunity to a subsequent attack. In the hope that their blood contains the necessary antibodies, women who have, or have recovered from hepatic eclampsia, should make desirable donors. Blood transfusion not only saves the lives of a good many obstetrical patients, but it often shortens their stay in the hospital and prevents invalidism.

Dr. H. H. Donnally: The doctor would inquire how often a donor may be used for transfusion of the same patient. In transfusion of children that question comes up because of the relatively small amount of blood a child requires. In the discussion Dr. Lindsay called attention to the fact that an adult was given 4 transfusions from a single donor. Promptly after the fourth transfusion a severe attack of asthma occurred in the recipient. Dr. Neuman reported 2 cases of repeated transfusions, 18 times in 1 recipient and 36 in another recipient with no reactions. I should like to know about the number of times one donor may be used in one patient and what the contraindications are to repeated use of the same donor. At Children's Hospital we have used the same donor only a limited number of times. Before each transfusion cross-matching of donor's and recipient's bloods is carried out.

Dr. Joseph S. Wall: I am also one of those who is unable to add to the discussion of this extensive subject, but there are one or two animadversions which may be pertinent to that part relating to the use of transfusions in children. In the first place, I would take exception to the remarks made by my colleague, Dr. Minor, who criticized the extensive number of conditions referred to by Dr. Bier in his part of the symposium. Dr. Minor very graciously closed his argument with the statement, "that I did not know anything about the use of transfusions in children," but anyone who passes through the wards of Children's Hospital will almost certainly see a patient there being transfused or infused. Transfusions in infancy and childhood are of particular importance for several reasons. In the first place the new-born infant is especially prone to bleed as is well known, and such bleeding may quickly result in exsanguination and death. It may also be admitted that infants and children rapidly approach critical states both through loss of blood and loss of body fluids, because of their special predilection for acute gastro-intestinal disturbances, notably acute fermentative diarrhea. They, therefore, require as a life-saving measure instant transfusion or infusion of solutions other than blood. If we recall the average dosage of blood recommended in several of the papers, namely, 10 to 15 cc. per pound of body weight, the latter dosage in an 8-pound baby would amount to 120 cc. or approximately 4 ounces of blood. This same proportionate dose if administered to an adult weighing 150 pounds would represent 2250 cc. or 1 quart plus $\frac{1}{2}$ pint of blood. Certainly the amount named would in all probability help any sick baby if introduced into its blood stream.

Further discussion was participated in by **Drs. Lester Neuman, Edmund Horgan, Herbert P. Ramsey,** and **Walter R. Stokes.**

THE TRIAL ASPECT OF MALPRACTICE CASES*

Charles S. Baker
Washington, D. C.

It seems that most physicians are agreed that when a doctor enters the court room, and places his fortune as well as his good name in the hands of 12 of his 'peers,' these same 12 men undergo a strange transformation and immediately become, to him at least, a group of anarchists.

The doctor, and even his lawyer, are usually at a loss to understand this transformation. They are as puzzled as was the young attorney whose first jury case brought him into Court with a claim against a railroad company for a collision at a crossing, in which the plaintiff-farmer's wagon was destroyed and 12 pigs were killed.

---

* Read before the Society, December 7, 1932.

The young lawyer counted upon the natural prejudice of these 12 'peers' against the Mammoth Railroad Corporation. With great assurance, therefore, and with ever increasing fervor he addressed the Jury at the end of his case, and demanded that they award his client a verdict, in about the following terms:

"Gentlemen, as you have learned from the evidence, my poor client is sitting here, mourning the loss of not 1 hog, not 2 hogs, not 3 hogs, not 4 or even 5. He is sitting here bewailing the loss of 12 hogs, Gentlemen. I say 12 hogs. Just the number that occupy this Jury box today."

He was unable to understand the verdict that was rendered against him.

Unfortunately, a Jury is not a "fact-finding machine." It is supposed to be, but in effect, it is an extremely sentimental and emotional piece of humanity.

Without intending so to do, the average Jurymen permit sentiment and emotion to affect them to an unbelievable degree. The courts often refer to this tendency in their opinions. The moment the patient takes the stand and tells of the suffering and misery incident to some operation or operative treatments, the plaintiff has the Jury's sympathy. They picture themselves 'in the same boat.' They forget that the pain and suffering involved may be a necessary incident to the treatment which will ultimately develop most beneficial results and possibly save life. They think only of the pain and suffering and look for some one upon whom the blame may be fastened. The natural one to catch the blame is the doctor.

This prejudice on the part of Jurys is so well recognized that when representing a defendant in personal injury cases, it is usually extremely advisable to limit the scope and period of medical testimony on behalf of the plaintiff concerning the accident. Even where the attending physician may open himself wide to criticism, it is often better practice not to cross-examine him. Nothing should be done which will focus the attention of the Jury upon the emotional side of the case rather than upon the principal fact. The principal fact in such a case is, of course, the question of whether or not the defendant is guilty of negligence.

Now, of course, the goal for which every physician should strive is to provide no patient at any time with a background which can be skilfully moulded into a malpractice case.

Malpractice means bad practice. It is generally recognized that a physician or surgeon is not required to exercise extraordinary skill and care, or the highest degree of skill and care possible, but is only required to possess and exercise the degree of skill and learning ordinarily possessed and exercised under similar circumstances by members of his profession in good standing.

A qualified physician is not liable for an error of judgment in making a diagnosis if he applied ordinary and reasonable skill and care, or kept within recognized and approved methods, or if he formed his judgment after a careful examination. On the other hand, where there has been negligence in previously collecting data essential to a proper conclusion, or in the subsequent conduct in the collection and use of instrumentalities with which the physician may execute his judgment, or where the physician omits to inform himself by proper examination of the facts and circumstances, and injury results, he is not relieved of liability for errors of judgment.

Thus physicians realize that the obligation to the patient begins from the moment the physician is retained. The physician must use reasonable care in making his diagnosis. A physician must not abandon a case after once accepting it without providing suitable alternative attendance. He must gauge the frequency of visits according to the needs of the patient and the surrounding conditions. He must obtain the consent of the patient when the latter is in possession of his faculties and no emergency makes it impracticable to confer with him. He must apply the attendant or the family of the patient with necessary and proper instructions. In the event of contagious or infectious cases, he must exercise care in advising and warning members of the family, or others liable to exposure. He must carefully choose his assistants, and he must exercise proper care in all collateral matters such as making out prescriptions, etc.

In speaking of malpractice cases generally, however, there comes to the mind of the physician and of the layman, that class of operative cases wherein the patient feels that the attending physician or surgeon has apparently lacked the necessary skill, or has failed to use it, or has not followed the approved methods in general use; as a result of which the injury complained of was occasioned. Many patients feel that every physician who administers a dose of medicine, and every surgeon who performs an operation, does so at his peril if the result happens not to be good. Fortunately for the physician and surgeon, the Courts have recognized the fallacy of this reasoning, and have repeatedly held that the physician or surgeon does not guarantee the results at which he aims.

When one analyzes a group of typical malpractice cases, it becomes apparent at once that they depend upon a family tree, in that the essential features split off in pairs.

First, we must scrutinize the case to see whether it is "fake" or "genuine." The average physician feels that 9 out of 10 cases are "fake." The average layman feels that 9 out of 10 cases of true malpractice are never brought to light, because the patients never become aware of what has transpired. There is probably a considerable degree of truth in both of these assumptions. This feature of the situation is entitled to lengthy discussion at some time because a determination to analyze honestly, and deal fairly on the part of the medical fraternity, in cases of genuine mistake or neglect would tend to allay and perhaps eliminate the unfair practices resorted to in many instances by the complaining patient.

In the second place, we recognize that there are two elements to every case of malpractice, both of which are necessary to adequately establish such a case. Briefly, a physician owes a duty to the patient which, to establish malpractice, must be breached. But at the same time, even though a breach of this duty be shown, it is not enough. There must be in the second place a causal connection between the breach of this duty and the injury complained of. Unless both elements are proven the plaintiff-patient can not successfully establish the alleged malpractice.

Next, there are two essentials in proving or in defending such a case. First, there must be the lawyer who understands the necessary ingredients of proof. Likewise, there must be the medical expert who is prepared for the plaintiff to testify to a breach of the duty imposed upon the attending physician, or who, on behalf of the defense, is prepared to testify to the fact that there has been no breach of such duties.

Then the cases themselves may be roughly divided into two classes; those which have to do with operative procedure, and those which do not. Obviously, the former class is much larger and receives more widespread attention.

We may now divide the operative cases into two types. There is that class of cases in which some foreign object is left in the patient's anatomy, and in which the attorney for the plaintiff is apt to feel that no expert testimony is, therefore, necessary on behalf of the plaintiff, and that no amount of expert testimony can avail on behalf of the defendant. In the other type, we have no foreign objects which, unaided, establish what might be termed a prima facie case of negligence, but depend solely upon the expert witness who is prepared to testify that the attending physician or surgeon has been guilty of some breach of duty, which, in turn, had directly contributed to a bad result.

Finally, when a malpractice case is threatened, there are two things to do: First, try to keep the case from getting into Court and secondly, if unsuccessful in this, try to keep the case from getting to the Jury.

Keeping in mind these general classifications, we are now prepared to examine certain typical cases to test the application of the above elements and essentials to see what happens in actual practice.

In making this examination of cases, we must, of course, keep in mind the fact that the Courts throughout the country are not uniform in their rulings. They are, fortunately, in accord in most of the fundamental principles governing malpractice cases. When it comes to borderline propositions, however, there is considerable variation among the various jurisdictions. It is, perhaps, of particular interest to us to note that the Courts of the District of Columbia are much quicker to grant a directed verdict in favor of a defendant-physician in a malpractice case, than are the Courts of most of the State jurisdictions.

The well known case of Ewing v. Goods, which was decided by Judge Taft while sitting as United States Circuit Court Judge for Ohio, exemplifies the proposition that there must first be a breach of duty by the physician, and secondly, that a causal connection must be established between the breach of this duty and the result complained of. In this instance the plaintiff was suffering from a cataract of the right eye. She consulted a specialist. She subsequently developed glaucoma. The physician operated. The sight of the right eye was lost, and that of the left eye impaired.

Judge Taft directed a verdict in favor of the physician, stating: "Before the plaintiff can recover, she must show first, that defendant was unskillful or negligent, and second, that his want of skill or care caused injury to the plaintiff. If either element is lacking in her proof she has presented no case for the consideration of the jury. The naked facts that defendant performed an operation on her eye, and that pain followed, and that subsequently the eye was in such bad condition that it had to be extracted, establish neither the neglect and unskillfulness of the treatment, nor the causal connection between it and the unfortunate event. A physician is not a warrantor of cures. If the maxim, res ipsa loquitur were applicable to a case like this, and a failure to cure were held to be evidence, however slight, of negligence on the part of the physician or the surgeon causing the bad result, few could be courageous enough to practice the healing art, for they would have to assume financial liability for nearly all the ills that flesh is heir to."

Strangely enough, this case deals not alone with the necessity of proving the two elements just referred to. It also deals with the next proposition which we discussed among the essentials; namely, that in the average case it is necessary not alone to have a competent attorney, but it is equally necessary to have competent expert witnesses. In other words, the plaintiff above offered no expert testimony to establish the fact that the negligence complained of was the basic cause of the injury. She relied upon the proposition that the result was itself sufficient to establish at least a prima facie case of negligence. Judge Taft did not agree with this conclusion.

In pursuing this proposition, the question naturally presents itself: what degree of skill and learning is a physician or surgeon required to possess and exercise in order to avoid a breach of his obligations? A case decided in the District of Columbia in 1910 holds that the degree of skill and learning that a physician or surgeon is required to possess and exercise is that ordinarily possessed and exercised by members of his profession in the same line of practice in the locality.

Again in 1914, the Court of Appeals of the District had occasion to consider a case in which the Administrator of a patient who had died under the effects of ether had brought suit against the attending surgeon. The Court held that a verdict was properly directed for the defendant when death was alleged to have resulted from negligence in the administration of ether to a patient having a weak heart, when the testimony of all the expert witnesses did not indicate certainly that the death did result from ether, although many, defendant among them, did testify that the ether may or may not have been the cause; the Court holding in effect that legal responsibility of one person to another can not be predicted upon evidence from which the Jury can draw an inference only by speculation, it being necessary that the evidence be positive to such a degree that the inference naturally arises.

In 1927 our Court of Appeals in affirming a verdict of the trial Court for a defendant-physician, touched upon the distinction between cases involving only the question of the sufficiency of the treatment and those cases in which there is something which of itself implies negligence. The Court stated: "Counsel for the plaintiff, on the question of burden of proof, cites Davis v. Kerr, 239 Pa. 351. In that case, a gauze pad had been left in the body of the patient by the operating surgeon. Under no school of medicine could it be said that the leaving of a gauze pad in a wound was proper practice. The difference between that case and the case at bar involving as it does the merits of a treatment of the patient, is apparent."

With this distinction in mind it may now be interesting to examine two or three typical cases which carefully analyze and define the respective rights of patient and physician.

Mr. L. T. Stryker, for many years counsel for the Medical Society of the State of New York, tells of a case in which the plaintiff had originally suffered from a ruptured Fallopian tube as a result of ectopic gestation. The operation disclosed extensive hemorrhage. The peritoneal cavity became filled with blood. As the intestines pushed upward toward the incision the defendant physician used a number of large packoffs. Each of these was snapped to an artery clamp through the use of an attached buckle. As the packoffs were changed they were dropped in a pan. Obviously, speed was an essential element, and the operation proved to be successful. Before the incision was closed the defendant physician and his assistant felt in the abdominal cavity to make certain that none of the packoffs has been left. The nurse in charge of the operating room was also asked for the sponge count.

In preparing for this operation it seems that the nurse in charge had arranged a number of these large packoffs and a number of smaller ones as well. The defendant physician did not have occasion to use any of the smaller ones, but in some manner one of the latter must have become entangled or rolled in a large packoff. Several months after the operation the patient complained of pain, and an X-ray revealed the presence of a buckle. The defendant operated and removed the small packoff with buckle attached. It should be stated that the nurses in attendance at the first operation as well as the second were employees of the hospital and not of the defendant physician.

The patient sued the surgeon. Her lawyer apparently considered it a perfect example of what we know as res ipsa loquitur (the thing speaks for itself), and concluded that he need not offer any expert testimony. Every effort was made to persuade the trial Judge to direct a verdict in favor of the defendant, but this was not done and the Jury returned a verdict for $5,000.

The Court of Appeals in reversing the lower Court stated: "Plaintiff's theory was that the leaving of the packoff in the abdomen made the lack of skill and want of care so obvious that expert testimony was unnecessary. But defendant called an expert who said that proper and approved methods were used in the operation, and then inferentially that there was no negligence. He stated that it would have been unwise for defendant to have made a more extensive search for foreign substances in the abdominal cavity at the close of the operation and might have caused paralysis of the intestines; also that it was proper and customary for the operating surgeon to rely on the nurse's count of sponges, packoffs and gauze placed in and removed from the incision. Plaintiff did not rebut defendant's medical evidence that proper and approved methods were used. The presence of the packoff in the abdomen after the first operation suggested that proper care had not been used, and required defendant to offer proof in explanation. But when defendant's expert witness stated that proper and approved methods were used in the operation, the possible inference of negligence because the packoff had been left in the abdomen was destroyed."

The above case undoubtedly enunciates the correct principles governing what may be termed the foreign-body cases. A number of these cases have been tried in the District. Very frequently they result from the failure to remove a drainage tube. Generally speaking, the defendant surgeon does not have as good a defense as did the defendant in the above case. And unless the case is taken from the Jury by the trial Judge, a verdict for the plaintiff is very apt to result.

In a case tried here recently, the plaintiff testified that she had been operated on for appendicitis; that she made a fair recovery and was finally sent home by the defendant surgeon. She stated that some days later pain developed in the region of the incision, followed by nausea and other distressing symptoms which continued for a period of weeks with ever increasing intensity.

Her attorney next placed on the stand a local physician who testified that the plaintiff had come to him complaining of the ailments above mentioned, and that he had found a slight discharge from the old operative scar. He testified that he dressed it and on the occasion of her second visit in redressing the wound discovered a piece of flat rubber tissue, apparently placed in the incision by the defendant as a drain. In this instance, the attorney for the plaintiff relied upon the doctrine of res ipsa loquitur. A motion was made at the end of the plantiff's case for a directed verdict. The Judge denied this motion and required the defendant to put on his testimony.

The defendant stated that he could not remember whether he had left the drain in question in the incision, but that he did remember a slight discharge had persisted in the incision and that he had placed the drain on several occasions while the patient was under his care in such a position that it extended under nothing but the surface tissues. He stated that plaintiff had been unable to remain longer in the hospital because of expense, and he could see no reason why the family physician should not take care of patient from the time she was discharged. The fact was emphasized that the patient had not returned to the defendant when trouble developed.

Several expert witnesses were then called, through the coöperation of the local Medical Defense Committee, and these witnesses when asked a hypothetical question reciting the above fact, were unanimous in stating that a drain so placed in the surface tissue could not have caused the acute symptoms complained of by the plaintiff. They likewise stated that a mere surface drain of the type described, located in the manner indicated, could cause no appreciable pain or injury of any kind. One of the witnesses compared the drain to a simple splinter which had been lodged under the outer skin. After a lengthy argument, the trial Judge decided that the interference of negligence had been overcome, and directed the Jury to return a verdict for the defendant.

In a very close case tried in the District and decided in 1929, the defendant was not so fortunate. Briefly stated, the facts showed that the plaintiff, after several treatments for throat trouble, went again to defendant's office and complained of "wax or something" in her right ear. The defendant thereupon reached in his cabinet where there stood a number of bottles, all alike in appearance, and but a single dropper for the use of all of them. Defendant then injected some fluid in plaintiff's right ear, whereupon she claimed she instantly became dizzy and suffered horrible pain, etc. The defendant then called a specialist who later examined her, and he testified that various diseases or injuries might have caused the condition which he found, i.e., the ear drum of the right ear was practically all gone, and that of the left from one-third to one-half gone, or this condition might have been caused by the injection of some destructive substance in the ears, and that he was unable to state from his examination the cause of the condition. In answer to one question, he stated, "Why, she had to have something in there to destroy the ear drums. They were destroyed. My opinion is that they were destroyed by something that was put in the ear."

The defendant introduced evidence, including the testimony of experts, tending to sustain the claim that the fluid which he injected in the plaintiff's ears was pure mineral oil; that it caused no injury, and that it was proper treatment. He stated that the plaintiff was not prostrated by the treatment as claimed by her, but was dizzy and nauseated before the treatment, and was relieved and benefited by it. He said that when he examined plaintiff's ears, he saw that her ear drums were perforated and that he dropped in a viscid mineral oil for the purpose of closing up the external ear drums in order to prevent the noise from penetrating into the middle ear.

It will now be obvious that in this last case, no matter how impressive the statement of the defendant, and no matter how many expert witnesses that the defendant may have put on the stand, there still remains the statement above referred to made by the expert placed on the stand by the plaintiff. In other words, even though the testimony on behalf of the defendant was overwhelmingly impressive as compared with that elicited by the plaintiff, nevertheless there is a question as to which witnesses shall be believed, and how far their testimony shall be credited.

As the Coürt said: "It is well settled that where there is uncertainty as to the existence of either negligence or contributory negligence, the question is not one of law, but of fact, and to be settled by a Jury; and this, whether the uncertainty arises from a conflict in the testimony, or because the facts being undisputed, fair-minded men will honestly draw different conclusions from them."

The Court again referred to a District of Columbia case in which it was said: "Where there is testimony of a substantial character to go to the Jury, it is always for the Jury to determine the question of the preponderance of evidence, subject to the revisory power of the Court to order a re-trial."

"A motion to direct a verdict is an admission of every fact in evidence, and of every inference reasonably deducible therefrom, and the motion can be granted only when but one reasonable view can be taken of the evidence and the conclusions therefrom, and that view is utterly opposed to the plaintiff's right to recover in the case."

Another and quite distinct type of case is now developing as the result of alleged burns from X-rays and other rays of the same general type. Space does not permit, however, an analysis of such cases in this article.

The conclusions to be reached are more or less self-evident. Every one who crosses the street represents a potential accident. Every patient assisted by a physician or surgeon represents a potential malpractice suit. A reasonable understanding of the factors involved in a malpractice case, backed by a proper degree of caution, should eliminate most of the trouble. When suit is threatened, immediate contact should be made with the Medical Defense Committee and with the attorney representing the insurance carried by the physician. They are often in a position to show the would-be-plaintiff, or his attorney, where the case in question is "no case." Failing in this, they are in a position to provide the most essential element of defense, namely the expert witnesses. Already, the Secretary of the Medical Society and the Medical Defense Committee, in coöperation with their legal representative, have accomplished very substantial results along this line.

ABSTRACT OF PAPER READ BEFORE THE SOCIETY

"Appendicitis: Some Observations Based On A Review Of 3,913 Operative Cases,"* by **J. M. T. Finney, Jr., M. D.**, Baltimore, Maryland.

This review is based on a study of 3,913 cases of appendicitis in which operations were done in one hospital by approximately 100 different surgeons during the period of 30 years. Only such cases are considered as showed definite disease of the appendix, gave a fairly definite history of one or more attacks, and were not complicated by other operative procedures. They have been divided into 6 classes: chronic, chronic recurrent, subacute, acute unruptured, ruptured with abscess, and ruptured with peritonitis. Cases were fairly evenly divided as to sex: 2,019 males and 1,894 females. The oldest patient was 90 years, the youngest 13 months of age. Visiting surgeons operated upon 3,201, the house staff operated upon 712. In the entire group there were 91 deaths: 67 male and 24 female, a mortality rate of 2.325 per cent total, or 3.32 per cent for males and 1.26 per cent for females, the former almost 3 times the latter.

---

* Presented January 11, 1933.

The mortality rate of the cases operated upon by the house staff was almost identical with that of those done by the visiting staff. This would seem to indicate that in the hands of a reasonably competent surgeon there is a certain basic minimum rate below which we can not go through surgery alone. Dividing the total 30 years into 5 year periods, the percentages of ruptured cases, leaving out of consideration the chronic and chronic recurrent groups, were as follows: 1900 to 1905, 45.85 per cent, and successively thereafter 42.16 per cent, 33.71 per cent, 22.87 per cent, 24.80 per cent, and 18.17 per cent. This shows a definite gradual, practically uninterrupted improvement, but still in the last 5-year period, 1926 to 1930, in almost 1 out of every 5 cases rupture had occurred when the patient reached the operating room. Without doubt the administration of a cathartic is a very dangerous thing. Among those who survived operation in the subacute group, 30.65 per cent had had a cathartic; in the acute unruptured group, 40.59 per cent; ruptured with abscess, 60.56 per cent; and ruptured with peritonitis, 61.54 per cent. Among the deaths in the acute group, only 20.0 per cent had had cathartics, but in the ruptured with abscess, the percentage was 83.33 per cent, and in ruptured with peritonitis, 73.08 per cent. It seems that far too great emphasis is laid on the textbook picture of signs and symptoms of appendicitis, and not enough attention paid to the fairly large atypical group which shows few if any of these guides. The most constant and useful seem to be localized point tenderness, and a relative increase in the polymorphonuclear leukocytes. Too great dependence should not be placed upon the white cell count as a whole, as an infallible index of the degree of the inflammatory process. In the last three groups 8.0 per cent showed counts of under 10,000 although the average counts in the whole groups were about as would be expected. Counts average slightly lower in the male than in the female. The average percentage of polymorphonuclear leukocytes in the six groups were 67.7 per cent, 67.1 per cent, 73.9 per cent, 84.0 per cent, 84.8 per cent, and 87.6 per cent, respectively. From the standpoint of duration of the attack, 2 of the ruptured cases had shown symptoms for less than 6 hours, 42 for 24 hours, and 164, or 24.2 per cent of the total number of ruptured cases, of less than 48 hours. One can not be too radical in the desire to get the case to the operating room at the earliest possible moment. As to mortality by groups: of 827 in the chronic group there was 1 death—a mortality rate of 0.12 per cent. Of the 731 recurrents, 1 death, or 0.14 per cent, and in the 548 subacutes, not a single death. In other words, by prophylactic or early operation, the mortality rate for 2,106 cases with 2 deaths was 0.095 per cent. Against this, in the 1,129 acute unruptured cases, there were 16 deaths, or 1.42 per cent; in the abscess group, 438 cases with 20 deaths, a mortality rate of 4.57 per cent. In the ruptured with peritonitis group, 240 cases with 53 deaths, a mortality rate of 22.08 per cent, a total increase over the early groups of more than 225 times. One additional factor recommending early operation is the economic one of average duration of hospitalization, which in the chronic group was 15.5; recurrent, 12.7; subacute, 12.9; acute, 14.3; abscess, 28.8; and peritonitis, 34.7 days, respectively. In all groups the hospitalization for females averages somewhat longer than for males. Also, in all groups the average time for the last 5-year period, 1926 to 1930, is appreciably less than the corresponding average for the last 30 years. An indication, at least, of better surgery and nursing care as well as fewer and less prolonged complications.

Medical Literature.—Next to conservatism and precision, clarity is demanded. One may be conservative in his claims or deductions and precise in his terms; yet his sentences may be so constructed as to leave much doubt as to his meaning. To achieve clarity, revision after revision may be necessary, and each improvement will usually follow a shortening rather than a lengthening of the article. The long sentences will be chopped into shorter ones, and these together will total fewer words than the original long sentence. Verbiage is detestable enough anywhere, but it constitutes a high crime in scientific literature. It befogs the thought, tries the reader's patience and lowers his interest, and gives the writing a pedantic, not to say asinine, appearance. Superfluous syllables may even be as harmful as superfluous words. Short words in common usage make for clarity and force and are always to be preferred to the longer or less used words except where these latter very definitely express the thought more precisely. To illustrate, there is no point in using such a word as "termination" if the word "end" expresses the thought just as well.

Brevity, besides being the soul of wit, is the heart and soul of good medical writing. By this I do not mean brevity at the sacrifice of essential points of the thesis, but rather at the sacrifice of rhetorical decorations. Medical writing is no place to "say it with flowers"—say it with plain words, good straightforward English words (if you are writing in English—Latin words and expressions will look more at home if the whole article is in Latin), and say it with the fewest possible words that can be used without making it look like a telegram. Last year a certain article appeared which attracted wide and favorable comment. In its original form the manuscript covered sixty pages without margin. In that form it was not only unpublishable, it was unreadable save at the loss of the reader's temper, not to say his mind. Many of the ideas it expressed were extremely sound and were very interesting and important, but most of them were expressed each about a dozen times during the course of the article. Because of the valuable information it contained, the article was saved and put through an editorial process, from which it emerged on twenty pages of manuscript with wide margin and without the omission of a single thought that had been expressed in its original form. Result—a nicely finished job, for which the author received much credit and the editor perhaps some condemnation from the author, who recognized in the article nothing of his own production except the thought and the signature.

An article may be conservative, sincere, clear, precisely and simply worded, and may impart new and valuable knowledge, but with all these virtues its worth as a piece of writing may be seriously lowered by poor organization. If the writer does not start at the beginning and end at the ending, the reader will find himself quite in the position of a person arriving at a movie at the middle of the picture. Since the title must be short, it can only convey a general idea of the article's nature, and unless the opening sentences give a more specific clue to the thesis, one may not discover until he nears the end whether the article contained the sort of information he hoped to find in it. Unlike the mystery story, the whole plot must be revealed quickly and neatly at the very beginning. The historical background is often helpful, if short enough, and a short résumé of the observations of others may give the reader a very desirable perspective of the matter under discussion. The paragraphs must follow each other in perfectly logical sequence, and tables, figures, etc., must appear at exactly the proper spots. If the tables are very numerous, covering more space than the article itself, they may appear together at the end of the article.

Above all, a summary should really summarize, and if there are conclusions of which the writer may be certain, they must appear and they must be worded with ten times the care given to the wording of the rest of the article. There are several reasons for this, one being that the conclusions are habitually the only part of articles read by many a busy reader, and another being that the whole scientific value of an article is wrapped in the conclusions.—Parsons, Robert P., M.C., U. S. N.: Medical Literature, The Diplomate, 1932 (Feb.) 4:45.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D.
C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D.
Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1932-33
President .... Harry A. Fowler, M.D.
1st Vice-President .... Henry R. Schreiber, M.D.
2nd Vice-President............ H. Gladys Kain, M.D.
Secretary-Treasurer........... Coursen B. Conklin, M.D

THE CHANGING TREND IN MEDICAL EDUCATION

If the graduate of medicine of about 25 years ago should examine the 1933 bulletin of a Class A medical school, not having kept well informed on the changes in medical education in the meantime, he would be confused and possibly completely nonplused at the radical changes that have taken place. He would remember that the catalogue he poured over when he contemplated entering the school contained illustrations of the exterior of the building, the class rooms and laboratory, and was a pamphlet of about a score of pages. Now he finds a volume of a hundred pages or more filled with solid printed matter and a complicated key to innumerable courses. He will notice that the lectures on anatomy and physiology have been largely replaced by laboratory work, and that the professors of medicine and surgery give relatively few class-room lectures but spend a large part of their time in hospital words. The fourth year finds the student in the medical school but a brief portion of his time; he frequently spends an entire day at one hospital. What does it all mean? Just this: that the bedside and laboratory are displacing the lecture hall. More and more time is devoted to fundamentals by intimate contact with living pathology, and surgical anatomy and physiological medicine and surgery have been brought into the field and applied to clinical medicine. It means that other allied arts and sciences have found their application in medicine and must participate in the finished pattern. Internal medicine as given by the Chair of Medicine usually included Osler Practice from cover to cover. The subject has been subdivided to include among others, neurology, gastro-enterology, pediatrics as a major course, cardiology, communicable diseases, syphilis, etc. The old professor would not recognize his dismembered child. Many new subjects have been added, including bronchoscopy, radiology, psychology, biochemistry, and serology. The present trend is to give the student a thorough knowledge of the fundamentals and to do so it is necessary to have in mind that the various essential subjects have been correlated and woven into a strong fabric which we may term the foundation of medicine, and to realize that a class of 50 to 100 students cannot be taught as a unit, since there is a wide variation between the receptive index of the poorest and the best student. To meet the first requirement, classes are divided into small sections that receive almost individual instruction in the laboratory or in the clinic. The second condition is met by having a minimum requirement of hours of instruction and permitting the student who shows particular aptitude to select additional subjects of his own selection, the so-called elective subjects. The elective subjects are designated by the faculty, are intimately related to some branch of medicine, and are conducted in the same rigid manner as other classes. The student is not expected to master every specialty and thereby become a "general specialist." Instead, he graduates with a sound understanding of the principles and practice of medicine. He is more of the "family doctor" type. Some of the elective courses in many of the colleges, for instance, are anesthesia, dermatology, orthopedic surgery, gastro-enterology and tropical medicine. As many as 20 electives are listed by some medical schools. The Committee on Medical Education in its very excellent and exhaustive report made this significant statement: "The present tendency is to develop self-reliance and responsibility in the student for his own training and to individualize that training according to his ability, interests, and preparation. These aims can be realized only on the basis of learning by doing. They can not be accomplished by didactic exercises and demonstration alone. . . . . These endeavors are in response to the realization that there can be no single way to learn or to teach medicine, but that the methods to be employed should be adapted as far as possible to the preparation and ability of the individual student." This all seems in line with modern progress, but only time proves the wisdom of the trend. Changes can be made, however, to meet new or different conditions. It is to be hoped that State Board Examinations in the future will be conducted by Boards that are alive to the radical changes in the curriculum and that will not propound questions that applied to former methods of instruction. One may pertinently inquire if the premedical course may not also be modified to meet the new order of things. The inflexible course does not usually permit students who are especially proficient or interested in chemistry to apply a large part of their time to it, that they may be able to follow through in its medical relations even after graduation so that our clinical researches in medicine may be undertaken by medical graduates and not by chemists who have but a vague insight into medicine. The entire subject is a very live one at present, and is receiving the attention it deserves from those best qualified to pass judgment.

THOMAS ANTISELL, A.B., M.D., Ph.D.
1817–1893

A Short Biography with Personal Reminiscences

D. Percy Hickling, M.D.

Upon my introduction to the study of medicine (1881–1884) one of the most outstanding, accomplished and distinguished physicians of the District of Columbia was Dr. Thomas Antisell, a man of kind and cordial personality, imposing in appearance and distinguished for his many achievements in medicine and related scientific fields. No physician was better known or more highly thought of than Dr. Antisell. He was for many years a teacher of chemistry, toxicology, military surgery, physiology and hygiene in the Medical Department of Georgetown University.

Dr. Antisell[1] was born in Dublin, Ireland, January 16, 1817, and received the degree of doctor of medicine from the Royal College of Surgeons, London and Dublin Lying-In Hospital, 1839. He was a member of the Royal College of Surgery, England, the Royal Dublin Society, and the Geological Society of Dublin. November 22, 1848 marked his arrival in New York City. He served during the war between the states from 1861 to 1865, acting as brigade surgeon, and medical director of the 12th Army Corps; later, the surgeon in charge of Harewood Hospital in this city. He was president of the board of examiners of surgery and assistant surgeon of the volunteers. He was brevetted lieutenant colonel for faithful and meritorious services during the war. He was decorated for valuable services rendered to Japan with the order of the Rising Sun of Meijii.

The Doctor was active both in the Medical Association of the District of Columbia and the Medical Society of the District of Columbia, the two organizations from which our present Society is derived. It was during his extended residence in the District of Columbia, 1855 to 1893, (with the exception of army service and foreign travel) that he served both professional groups. On September 12, 1861 he contributed a gift of books to the library. In 1864 he was a member of the committee on the preparing and publication of the original constitution of the Society. The first case reported to the Society by Dr. Antisell under date of July 19, 1865, was entitled, "A Fracture of the Skull with Abscess of the Brain." On February 1, 1864, he was chairman of a committee to consider the sanitary conditions of the District of Columbia, owing to the fact that smallpox was especially prevalent at that time. This committee made a report on March 7 of the same year. It was adopted and ordered to be printed. This report outlined a skeleton of the prospective duties of the Board of Health, and a committee was appointed to carry out the recommendations. A final report was made by Dr. Antisell on January 9, 1865, which was accepted, and the instructions were given to submit the matter to Congress. This was done. Dr. Antisell was also chairman of the committee on prize essays and on December 6, 1865 the committee announced that a prize for the best essay on "typho-malarial fever" in the District of Columbia and adjoining counties would be awarded. He was elected to deliver the annual address of the Society in 1876. In 1871 he was chairman of the committee consisting of Drs. Lincoln and Busey of the Medical Society to inquire into and report on the condition of the Health Department. In 1870 the Medical Society of the District of Columbia placed itself on record through the action of a committee of which Dr. Antisell was chairman, recommending the adoption of the metric system. Again on January 7, 1878, he was a member of the committee to protect the interests of the profession in the District of Columbia, in connection with the framing of our new form of government. Again he was a member of the committee appointed in 1882 by the Society which recommended an abattoir to be built across the eastern branch. In 1885, owing to the offensive odor presented in the drinking water of the District of Columbia, he was appointed a member of a committee that recommended proper filtration and aeration of the water on a complete scale by the authorities. In 1892, he was made an honorary member of the Medical Society of the District of Columbia. Dr. Antisell was Vice President of the Society, 1865–8, 1878; Corresponding Secretary, 1864.

---

[1] History of the Medical Society of the District of Columbia, 1817–1909.

Sometime after Dr. Antisell's death, which occurred on June 14, 1893, a handsome portrait was presented to the Medical Society of the District of Columbia, but during the several changes of meeting places of the physicians of Washington, it was stored away and forgotten. In 1931, Dr. Bennett, the Chairman of our House Committee, found it in the storage room of our new building. The artistic value of the portrait was immediately recognized. It was hung under his direction in the room set apart for the Executive Committee, and strange to relate, no one for a number of days was able to name the original of the portrait, despite its being an excellent likeness. It seemed that he was entirely forgotten.

TRANSACTIONS OF THE SOCIETY

Stated Meeting, March 1, 1933

The following were duly elected to membership:

Active Members

William Parker Herbst, Jr., 1726 Eye Street, N. W.
Richard V. Mattingly, 4707 Connecticut Avenue, N. W.

Associate Member

Benjamin Karpman, 1720 Irving Street, N. W.

Reinstated to Active Membership

Emmett E. Newcomer, 1029 Vermont Avenue, N. W.

Applicants for membership to be voted on in May:

For Active Membership

Philip Alexander Caulfield, Georgetown University—1929
Frank Duncan Costenbader, University of Virginia—1929
Macpherson Crichton, Hahnemann Medical College—1898
William DeKleine, Northwestern University—1906
Frank Stephen Horvath, Royal Hungarian University—1915
Allan Edward King, Georgetown University—1913
Gilbert Haven Mankin, Cornell University—1917
Beveridge Miller, George Washington University—1931
Isaac Judah Silverman, University of Melbourne—1911 (Formerly an Associate Member)
Charles William Tegge, Northwestern University—1928
Eugene E. Willison, Indiana University—1927

For Associate Membership

Errett C. Albritton, Johns Hopkins University—1921
Alfred T. Bronaugh (Pharm. D.), National College Pharmacy—1893
Sanford M. Rosenthal, Vanderbilt University—1920

Amendments to the Constitution and By-laws adopted:

1. Article VII, Section 3, of the Constitution was amended to read: "The Committee of Censors. Committee on Publication, Committee on Public Information, House Committee, and Committee on Civic Health, shall consist of five members each, and shall be appointed by the President at the time of his assumption of office, to serve until their successors are appointed. Vacancies shall be filled as they occur by appointment by the President. The chairmen of these committees shall be designated by the President, and shall be ex officio members of the Executive Committee."

2. Article XI of the By-laws, pertaining to Medical Defense:

(a) Section 6 was amended to read as follows: "If a member applying to the Medical Defense Committee for assistance is protected by an insurance policy indemnifying him against loss by reason of malpractice, the committee shall lend such assistance, except financial, as in its judgment is advisable."

(b) Section 10, the third sentence, was amended to read: "Without such written agreement the Medical Defense Committee shall render only such assistance as provided in Section 6."

(c) Section 11 was amended to read as follows: "The Medical Defense Committee shall obtain the services of competent counsel as occasion requires, to advise and defend members entitled to the benefits of this By-law; but the member involved in any case shall have the right to employ additional counsel, at his own choice and at his own expense, provided, however, that the Medical Defense Committee retains complete control of the case."

A Nominating Committee was elected by the Society to select nominees for each elective office, also members of the Executive Committee and Program Committee. The personnel of the committee is as follows:

Arthur C. Christie, *Chairman*
Edgar P. Copeland
P. Edward Larkin
Harry S. Bernton
Francis X. McGovern

Upon recommendation by the Executive Committee, the Society voted that the Davidson Lecture be held on the second Wednesday in October of alternate years.

Pursuant to action of the Society the President, Dr. Harry A. Fowler, was empowered to appoint the following committees:

(a) To act in an advisory capacity to the Association for the Prevention of Tuberculosis of the District of Columbia, cooperating with committees from certain other organizations:

A. Barklie Coulter, *Chairman*
Edmund Horgan
Montgomery Blair, Jr.

(b) To study the entire question of the Costs of Medical Care and report to the Society its findings and recommendations:

Thomas A. Groover, *Chairman*
Joseph S. Wall
William H. Hough
Oscar B. Hunter
John D. Thomas
H. C. Macatee
Harry H. Kerr

By action of the Society the names of Dr. H. S. Bernton and J. Russell Verbrycke, Jr., were added to the list of personnel of the Business Affairs Committee for the purpose of perfecting a plan for a Credit Bureau.

ACTIVITIES OF SECTIONS

The Section on Ophthalmology and Oto-Laryngology will furnish the scientific program for the regular meeting of the Society on April 12, 1933:

1. "Exophthalmos." Dr. Albert D. Ruedemann, Cleveland Clinic, Cleveland, Ohio.
2. "The Specific Treatment and Prophylaxis of Septic Meningitis." Dr. John A. Kolmer, Professor of Bacteriology and Pathology of the Research Institute of Cutaneous Medicine, Philadelphia.

EXTENDED ACTIVITIES OF THE WASHINGTON HEART ASSOCIATION

The Washington Heart Association, which has been in existence about three years, and which until now has been composed entirely of physicians interested mainly in the scientific study of heart disease, has recently taken steps to extend its activities to include preventive measures against heart disease and social service work to patients with heart disease. A Board of Governors of twenty members will be formed consisting of both physicians and laymen. A number of prominent laymen have consented to be members of this Board. The membership of the Association has also been extended to laymen. A full-time executive secretary, Mrs. Wade Martin, has been engaged, with offices at 1315 Nineteenth Street, N.W. The problem of heart disease is a very serious one, inasmuch as deaths from heart disease outnumber those from any one cause. The death rate from heart disease in Washington is greater than that in any other city in the United States. Preventive measures and proper treatment of heart disease will do a great deal to reduce the mortality and morbidity rates. The Washington Heart Association is a consitituent unit of the American Heart Association. Its president this year is Dr. James A. Lyon; vice president, Dr. Lewis C. Ecker; secretary-treasurer, Dr. James W. Esler. Other members of the executive committee are Drs. Wallace M. Yater, Thomas S. Lee and Leslie T. Gager.

ANNUAL MEETING

The Annual Scientific Assembly of the Medical Society of the District of Columbia will occur on April 25 and 26, 1933. The time of the assemblies in connection with the annual meeting has been advanced because of the large number of medical conventions which will be held in Washington the following week. On the evening of May 3rd, the first Wednesday, the election of officers and the transaction of other annual business will take place. The Program Committee is arranging a very interesting program. The two morning sessions will be devoted to clinics at the hospitals; one morning to medical clinics and the other to surgical clinics. The afternoons will be devoted to scientific papers at the Medical Society Building. Scientific and technical exhibits will be held *both* days at 1718 M. Street. A number of commercial houses will again show some of the newer advances in therapeutic products and equipment. Out-of-town speakers have been engaged. Those who have already accepted are Drs. Maude Abbot and Leonard G. Rowntree. Dr. Abbot is curator of the medical museum of the McGill University, Montreal, Canada, and the world's greatest authority on congenital heart disease. She was a close friend of Osler. Her subject will be "Personal Reminiscences of Osler, and Remarks Concerning his Contributions to our Knowledge of Heart Disease." Dr. Rowntree is director of the Philadelphia Institute for Medical Research, and was formerly chief of medicine at the Mayo Clinic. The subject of his paper has not been announced. The usual complimentary luncheon at the Mayflower Hotel will be given. Entertainment for members of the Society and their guests and wives will be provided one evening, and a public meeting the other evening. Members of the Society and their guests are urged to register on *Tuesday, April 25, between 8 a.m. and 10 a.m.* A trip by the Society's building before clinic attendance will make this possible. It is from the list of registrants that the *complimentary* tickets for luncheon and other events are distributed. Note well these dates, *April 25 and 26*. Send invitations to your medical friends to attend.

THE KOBER LECTURE

The Kober Day Celebration will be held this year on Tuesday, March 28, at 8 P.M., in Gaston Hall. Under the provisions of the Kober Foundation, on the 28th of each March in commemoration of the birthday of the late Dr. George M. Kober, formerly Dean of the Georgetown University School of Medicine, a medal is awarded and a lecture delivered. The medal this year will be awarded to Dr. Alfred Newton Richards, Professor of Pharmacology at the University of Pennsylvania. Dr. Richards has made a specialty of medical research regarding the kidney, and in acknowledgement of his contributions to science in this field the medal has been awarded by the Association of American Physicians. Due to certain circumstances this year the actual presentation of the medal will take place on May 9 instead of March 28. The presentation will be made at the meeting of the Association of American Physicians in Washington.

The lecture will be delivered this year by Dr. R. E. Dyer, United States Public Health Service. His selection was made under the terms of the Foundation by the Association of Military Surgeons of the United States. The doctor's work in the epidemiology of typhus fever in this country is well known.

ABBOTT LABORATORIES

Sudden Death of the President, Dr. Alfred S. Burdick

Dr. Alfred S. Burdick, president of the Abbott Laboratories of North Chicago, Illinois, died Saturday, February 11, of pneumonia, at the age of 66. He was buried the following Wednesday at Rosehill Cemetery, Chicago. In 1921 Dr. Burdick was elected president of the Abbott Laboratories. The new location at North Chicago had already been selected as a site for the new Abbott Laboratories and when the latter was completed the company moved into these new quarters from the old location in Ravenswood. Meantime the Swan-Myers Company of Indianapolis was consolidated with Abbott Laboratories, thus increasing and extending the business. Most or all of these improvements took place under the presidency of Dr. Burdick. In fact the completed plant, which is one of the largest and best in the United States, is in many respects a tribute to the genius and wisdom of Dr. Burdick. He had surrounded himself with some of the best executives as well as professional men and thus built up an organization which will continue to efficiently function, notwithstanding Dr. Burdick's premature death.

AUGMENTING MILK VITAMINS

Fatigue and general debility indicate conditions that generally can be corrected by proper diet and rest. Proper diet means *adequate, well-balanced nourishment.* Not over-eating, for that disturbs digestion, causes sleeplessness and further complicates the condition. Cocomalt mixed with milk provides the varied nourishment of a well-blanced meal without the slightest digestive strain. Its high coloric value and easy digestibility make it especially effective in helping to throw off that nervous, devitalized feeling of which so many patients complain—unless, of course, there is some serious, chronic ailment which must be corrected. Cocomalt is an honest food, ethically advertised. It is accepted by the Committee on Foods of the American Medical Association. Laboratory analyses show that Cocomalt increases the protein content of milk 45 per cent—the carbohydrate content 184 per cent—the mineral content (calcium and phosphorus) 45 per cent. It contains not less than 30 Steenbock (300 ADMA) units of Vitamin D per ounce—the amount used to make one glass or cup. Cocomalt mixed with milk is especially useful in pregnancy and lactation, in illness and convalescence, and for underweight, mal-nourished children. The discovery of Vitamin D has been of the greatest importance to mankind. Because of this discovery, rickets—once a familiar childhood menace—is now fast becoming a rare disease in civilized countries. The value of Vitamin D in the dietary of the pregnant woman can not be over-emphasized. For it is largely in prenatal life, as McCollum says, that "the size of the fund of that something which we call vitality is determined. It is then that the quality of the teeth, the skeleton, and the perfection of form are determined." Cocomalt mixed with milk is useful in the dietary of expectant mothers—not only because it has almost twice the food-energy nourishment of milk alone, not only because it provides extra proteins, carbohydrates and minerals (calcium and phosphorus)—but because it is rich in Vitamin D. Cocomalt is licensed by the Wisconsin Alumni Research Foundation under Steenbock Patent # 1,680,818.

PURITY OF MILK

Since 1921, when S.M.A. was first offered to the medical profession, it has been made only from fresh milk of the highest grade from an accredited dairy area where all herds are tuberculin tested under state and government supervision and where all farms are under complete farm inspection, in accordance with standard dairy requirements. In addition to the high standards of the district, S.M.A. Corporation enforces its own standards which are still higher. Purity of milk supply is just as important as ever, but appears to be in danger of being overlooked. This purity is one factor which causes S.M.A. to produce excellent nutritional results more simply and more quickly. Physicians who prescribe S.M.A. for their patients know that the purity is unquestionable, besides the fact that S.M.A. is the closest approximation of nature's own formula for the human infant both chemically and physically. It is simple to prescribe, simple for the mother to prepare and produces exceptional nutritional results in most cases.

SUPPLYING VITAMIN B

"When, As and If" the bottle-fed baby exhibits symptoms of indicating partial vitamin B deficiency—described by Hoobler as (1) anorexia, (2) loss of weight, (3) spasticity of arms and legs, (4) restlessness, fretfulness, (5) pallor, low hemoglobin, etc.—

Dextri-Maltose with Vitamin B may be used in adequate amounts (up to 71 Chick-Roscoe units) without causing diges-

Trademark Registered **STORM** Trademark Registered

Binder and Abdominal Supporter

gives perfect uplift and is worn with comfort and satisfaction. Made of Cotton, Linen or Silk. Washable as underwear. There are three distinct types and many variations of each type.

Picture Shows "Type N"

FOR PTOSIS, HERNIA, PREGNANCY, OBESITY, SACRO-ILIAC RELAXATIONS, HIGH AND LOW OPERATIONS, ETC.

Each Belt Made to Order *Ask for Literature*

KATHERINE L. STORM, M.D.

Originator, Owner and Maker

1701 DIAMOND ST. PHILADELPHIA

tive disturbance. This ethically advertised produce derives its vitamin B complex from an extract of wheat germ rich in B and brewers yeast rich in G. Physicians who have attempted to make vitamin B additions to the infant's formula, but who have been obliged to abandon this due to diarrheas or other unfortunate nutritional upsets, will welcome Mead's Dextri-Maltose with Vitamin B. This is a tested product with rich laboratory and clinical background and is made by Mead Johnson & Company, a house specializing in infant diet materials.

Not all infants require vitamin B supplements, but when the infant needs additional vitamin B, this product supplies it together with carbohydrate. In other cases, the carbohydrate of choice is Dextri-Maltose No. 1, 2 or 3.

CONTAGIOUS DISEASE REPORT, FEBRUARY, 1933

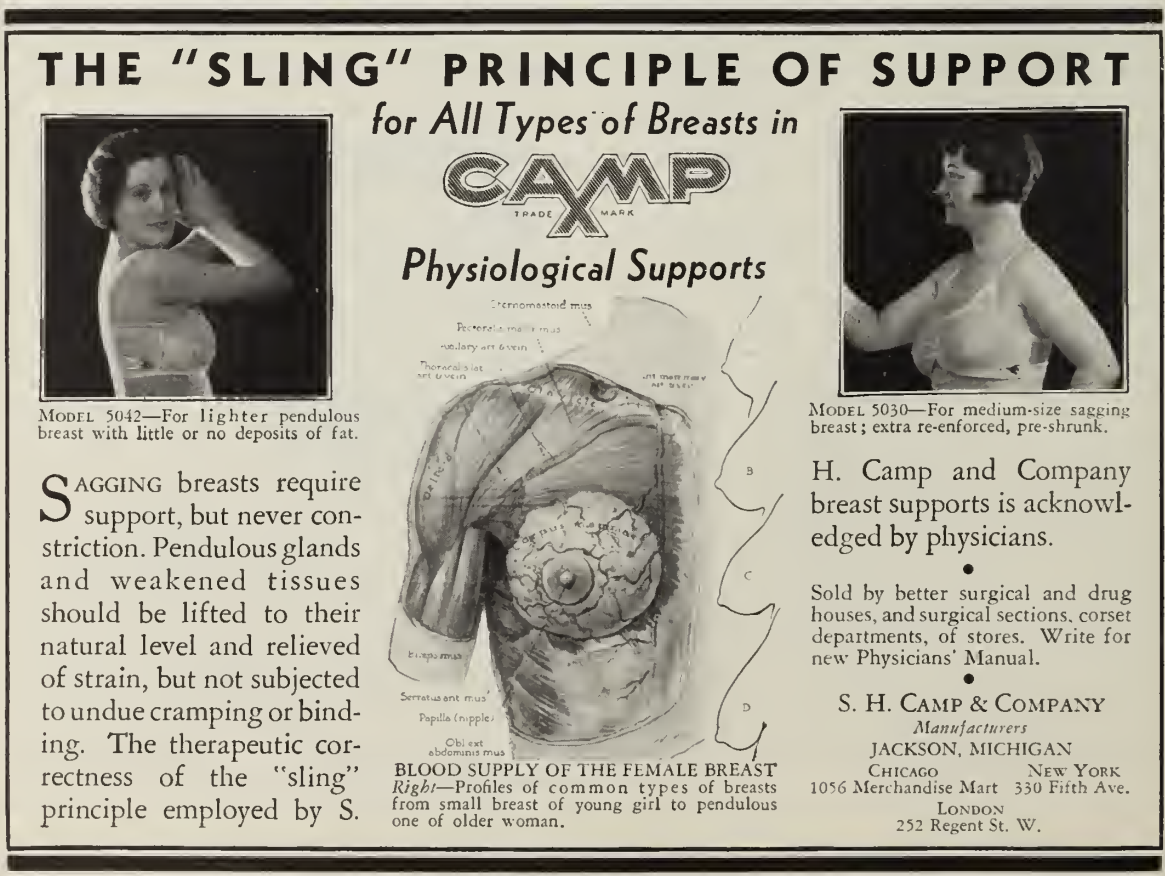
Health Department, District of Columbia

	Morbidity	*Mortality*
Typhoid fever	1	0
Typhus fever	0	0
Smallpox	0	0
Measles	14	0
Scarlet fever	47	0
Whooping cough	11	1
Diphtheria	31	1
Influenza	18	10
Poliomyelitis	0	0
Encephalitis-Lethargica	0	0
Epidemic Cerebrospinal Meningitis	3	4
Tuberculosis (all forms)	104	51
Syphilis	378	6
Gonorrhea	168	0
Chickenpox	139	0
Chancroid	4	0
Pellagra	0	0
Pneumonia (all forms)	127	64

PROPAGANDA FOR REFORM

Diabetic Foods

So-Called Special "Diabetic Foods" or Special Foods for Sugar and Carbohydrate Restricted Diets.—There is authoritative evidence that commercially prepared special "diabetic foods" are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. The designation of a food as a "diabetic food" merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Lay advertising for these special foods shall not include disease names such as diabetes nor directly or indirectly indicate that the foods are curative or increase the ability of the body to utilize sugar, or give the impression of harmlessness when eaten in unrestricted amounts by diabetic patients. Advertising of a medicinal or therapeutic character shall be limited to medical periodicals or material for physicians exclusively. The package label shall conform to the preceding requirements. (Jour. A. M. A., February 11, 1933, p. 411.)


THE "SLING" PRINCIPLE OF SUPPORT

for All Types of Breasts in

CAMP TRADE MARK

Physiological Supports

MODEL 5042—For lighter pendulous breast with little or no deposits of fat.

SAGGING breasts require support, but never constriction. Pendulous glands and weakened tissues should be lifted to their natural level and relieved of strain, but not subjected to undue cramping or binding. The therapeutic correctness of the "sling" principle employed by S.

BLOOD SUPPLY OF THE FEMALE BREAST
Right—Profiles of common types of breasts from small breast of young girl to pendulous one of older woman.

MODEL 5030—For medium-size sagging breast; extra re-enforced, pre-shrunk.

H. Camp and Company breast supports is acknowledged by physicians.

•

Sold by better surgical and drug houses, and surgical sections, corset departments, of stores. Write for new Physicians' Manual.

•

S. H. CAMP & COMPANY
Manufacturers
JACKSON, MICHIGAN
CHICAGO 1056 Merchandise Mart
NEW YORK 330 Fifth Ave.
LONDON 252 Regent St. W.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II APRIL, 1933 NUMBER 4

LIFE AND DEATH INSTINCTS*

WILLIAM A. WHITE, M.D.
Professor of Psychiatry, George Washington University School of Medicine

The nineteenth century has been spoken of as the century of materialism. When one recalls the very substantial character of matter as it was conceived of at that time, the word "materialism" takes on a particular meaning of its own, which is perhaps somewhat different from the definition of the philosophers of today. Matter in the nineteenth century was something that could be seen and felt and weighed, and so materialistic explanations of mind even then never progressed very successfully because mind lacks all these characteristics. It is intangible, imponderable and invisible. But since the close of the nineteenth century the physicists and the astronomers have been hard at work dematerializing matter, until today, as the English psychologist, Myers, puts it: "The once striking characteristics distinguishing matter from mind are fading rapidly. Mind appears to be no more 'unsubstantial' than matter; matter to be no more 'predictable' than mind." This sounds perfectly reasonable, and I think you will all agree with me that it is a fair statement of the changes that have happened in the last quarter century; but nevertheless all of us who studied our medicine in that century were brought up with the very materialistic point of view regarding mind to which I have already referred, and the greatest difficulty that now confronts the average individual when he undertakes to form some concept of mental functions is the difficulty of casting aside that whole nineteenth century materialism and viewing mind from the standpoint of function and predictability. I am going to ask you, therefore, for a few minutes to try to lay aside the distinction between mind and body and think with me of certain of the things that I am going to discuss as happening within the mind just as you would think of a function happening within the body. Certainly respiration as a concept is just about as abstract and immaterial as mind. Secretion as a concept is neither ponderable, visible nor tangible. We know it only by its results. What we call secretion may be considered an hypothesis that lies back of the visible facts and accounts for their existence. Nobody has ever seen gravity and yet we have a law of the way in which gravity acts. So please put aside your prejudices for the moment and think of mind in this simple way as something that does something, that has functions and whose functions have names.

Now, the two aspects of the human individual which I want to discuss with you briefly as they express themselves at the psychological level, or in the mind if you prefer, are the two aspects of the living organism, life and death, or, to be more specific, the tendency that moves in the direction of life and the tendency that moves in the direction of death. The life instinct, as it has been called, needs no defense. We all know that living organisms live, and we have a perfect right to speak of what lies behind that life as the "life instinct" if we wish to express it in that way. But recently there has been a great deal said about the death instinct, and most people spontaneously repulse the idea that the living organism has any instinct which leads it in the direction of death. If you will stop and think for a moment, however, it would seem that this argument defeats itself. Every organism does die some time; and therefore there must be some tendency, or something that corresponds to a tendency, within the living organism from the very beginning which makes it inevitable that that organism shall die. This tendency we call the "death instinct," and so it has been said in conformity with this theory: "Man does not die; he kills himself."

---

* Read before the Society, January 18, 1933.

I would not have you think from this statement that I go so far as some people do in believing that our entire destiny from the moment of the fertilization of the ovum to the day of our death is laid out in the germ plasm. This fails to take into account the whole group of factors which are properly called environmental and which may be determining factors. It may be true that a great violin player could not have developed his talent if it had not been for something specifically related to his genius which was laid down in the germ plasm, but it is equally true that he never could have become a great violin player if he had never had a violin to play. Similarly, an individual can not die of typhoid fever in the absence of the typhoid bacillus. However, let us develop this idea of a death instinct and see if it has any significance for the practice of medicine.

Let me remind you first of a generally overlooked fact but one which seems to me of great significance. If you will consider the life of the human being as beginning at the moment of impregnation you will appreciate that what happens between the moment of impregnation and the end of gestation so far as multiplication of cells, and increase in size and weight of the individual is concerned, is far beyond anything that ever again happens to the individual. The number of cells in the body has been increased literally by billions. Its weight and size have correspondingly increased, whereas after birth its weight and size increase perhaps ten or fifteen or twenty times. Fifteen or twenty as compared with billions is the comparison I ask you to bear in mind. If you will do this you will realize that from this point of view at the moment of birth man is really a long way on the path to death, and that the miserable seventy years that he may drag out upon this earth presents only a little bit of the possibilities of the life instinct that has expressed itself with such stupendous vigor in the preceding nine months.

Now let me give you the opposite picture. A man came into my office the other day who has reached his seventieth year. He wanted to consult me, strange as it may seem, as to whether he should have a certain surgical operation or not. For reasons which I will not enter into here I advised him to have it. It seemed to me it was in fact the only thing for him to do; and yet after he left the office I called up the surgeon who was to operate and said to him: "Doctor, this man has lived his life. He is through. There is nothing else that life has to offer to him, and I would not be surprised if he took this opportunity of the operation to slip away into the great beyond. I am saying this just to warn you, and suggesting that you be pretty careful and watch closely the postoperative period." You will note that I have expressed here in language at the psychological level what happens to all of us, that the abundant life with which we are originally endowed gradually and progressively gives place to a movement in opposite sign, and that the end, death, is inevitable. In this particular instance I feared death from this operation for the reasons that I gave. I knew this man's life and I knew that it had closed for him except for the vegetative functions, which still remained. His ambition was gone, his capacity for new adaptation was gone, his curiosity and his initiative were gone, his means in any direction in which one wished to look were gone. Under those circumstances the death instinct, as I have called it, is pretty apt to be lurking near at hand.

This matter as I have described it has been particularly emphasized in recent months. We are beginning to see all manner of social and personal disintegrations which have resulted from the loss of the means of living one's life at a level of interest and accomplishment. This is what we call "frustration"; and when frustration occurs in really very malignant form, such as results from the sentencing of a man to life imprisonment, we find that the gravest sort of disturbances, such as mental disease, are very common. My own belief is that if frustration could be made 100 per cent effective, then death would be the immediate outcome.

Now as between the abundance of life of the newly fertilized ovum and the approach of death to the old man there lie innumerable gradations, and it is these gradations about which I wish to speak very briefly. I think it is worth while when one sees a patient to think in terms of the relative strength of these two tendencies, and to undertake to interpret what one finds happening in terms of the success or failure of one or the other; and I feel certain that where life does not beckon to the individual with all sorts of allurements the death instinct is much more apt to have its way. I could tell you all evening of stories of mental breakdowns, of individuals who have been thwarted, frustrated, disappointed in life, and who have stayed sick because they have never had any reason to get well, because life has never offered them anything that was better than to continue as a patient in a mental hospital.

Death from this point of view, then, may be considered, at least in its somatic aspects, as the results of a continuing degradation of energy until it reaches its final stage of equilibrium, which corresponds to the stage of inorganic matter. But the important thing to which I wish to call your attention is that death does not exist wholly as a total reaction; that is, the organism-as-a-whole does not need to die in order that we may illustrate the death instinct. There are the partial deaths, attenuated suicides, incomplete dissolutions, local disintegrations, all of which belong upon this side of the equation. For example, there are a host of individuals, to whom I have already referred, who stay in hospitals for mental disease because the world offers them, from their point of view at least, nothing worth the struggle. They remain on the death side of the equation indefinitely, giving up all the strivings and ambitions of life. There are many somatically ill people who could be described in the same way. Then I have in mind a student at the hospital whose turn it came to affiliate with another institution. The student, however, did not wish to effect this affiliation but preferred to stay where he was. Nevertheless it seemed necessary to follow the usual course of procedure, but just as the student was about to enter the other institution he slipped and fell and was brought back to where he wanted to be in the first place. Now my contention is that while you may say that this was just a simple accident, the saying that it was an accident does not help in any way to envisage what really happened. If, on the other hand, you go on the assumption that this was really an intended result for the purpose of carrying out a desire you will see that we get a real explanation and understanding of the student's conduct. Perhaps we are wrong; but we have analyzed enough such instances to be able to make a pretty good guess that there may be something in it, and there are so many such things that are happening to human beings all the time that it is very well worth while to bear in mind that they may have some such explanation. Here we might speak of a partial death. The leg was sacrificed rather than the dominant wish. Then again I am sure you all know people who persistently expose themselves in various ways to colds, to wet, to disease, and who are often sick. And you also know the sort of person who, as I like to say, is too busy to have time to be sick, and he is very apt not to be sick. He is the sort of individual who is intensely interested in life, and sickness does not easily take hold of him. Addiction to alcohol is one of these attenuated methods of committing suicide. It leads to all sorts of possible exposures and in itself it reduces resistance and makes death more easy of access when illness does come. Disease, therefore, to the extent that it is used in this way, is disadvantageous to the organism because it reduces the available energy of the organism; and it reduces it in the ways I have mentioned in the service of a specific tendency, what we know as a wish.

We would not be prepared to make these interpretations, which may sound to you in some instances as grotesque, if we did not see among our patients the whole story writ large in the real, genuine attempts at suicide, and in the self-mutilations of patients. When we realize that the instinct to continue to live may be so far distorted as to eventuate in suicide, when we realize that the maternal instinct may be so far distorted as to lead the mother to kill her child, then we may begin to understand some of these less obvious situations. The woman who bites off her tongue because it has said immoral things, the man who chops off his hand because it has done wrong, and the individual who castrates himself for similar reasons—all of these are in the same class as the person who cuts his throat or his wrists, or who otherwise destroys himself.

Some of you, I am sure, are asking what is the practical result of all this "philosophizing," as you will probably call it. In the first place, I can not agree with you that it is all philosophizing. All of these things become very real to us who live with them twenty-four hours a day and who see these forces in operation. We may perhaps have been clumsy in our descriptions, possibly somewhat inaccurate and possibly even blundering, but fundamentally the things I have told you seem to us to be real truths that we meet in one form or another every day on our wards. Of what use is this kind of knowledge to you? It has very great possibilities of use. You remember I told you about the man who consulted me as to whether he should be operated upon and who I felt might die because I felt that he was really through with life. This same way of looking at a patient is the way in which every surgeon, for example, should look at every case upon which he is contemplating an operation of any magnitude. We have admitted to the hospital every year a certain number of patients who have developed psychoses following operation; and in a certain number of these cases it seems fairly clear that the patient either had a wholly distorted and exaggerated idea of what the surgeon was going to do, or else that the portion of the body operated upon had a significance for the patient which the surgeon did not appreciate.

In the first instance I have in mind a patient who was operated upon for the purpose of opening up and clearing out a broken down inguinal gland. He was convinced that the operation was, in some way at least, going to endanger his virility; and he came out of the operation and passed into a delirioid state from which he fortunately recovered quickly. His own account was that had it been clearly explained to him precisely what the operation was intended to accomplish he would not have been so badly frightened.

The other type of case is more complicated and depends, as I have already indicated, upon the value that the patient places upon certain organs. Certain organs of the body are very highly prized, others not so much so as a rule; but certain of these not so highly prized organs may become highly prized because of certain types of experience in the life history of the individual. For example, most individuals prize their eyes very highly, and frequently operations upon the eyes are followed by psychotic reactions. It is because this very highly prized organ of vision is threatened. The patient feels it to be in danger, and his psychosis is the result of this apprehension and anxiety. The same thing may happen in regard to other regions of the body that one does not usually think of as having such significance. For example, operations upon the nose are sometimes followed by psychotic reactions; but when they are, it is because the patient has very definite and peculiar ideas with respect to his nose.

Let me remind you here of Cyrano de Bergerac. Without pursuing the matter further, the general rule should be as follows: An organ or a function about which the important creative aspects of the personality have been centered and through which they have been expressed, should always be protected with the greatest care and should never be sacrificed under any circumstances, if it can possibly be avoided, for the salvaging of a function of lesser significance. And, further, no operation of election on an overvalued organ should ever be performed unless the patient is psychologically prepared.

These rules I have formulated and illustrated from the realm of surgery because there it is easier to see their application, although I hope you will understand that I have intended to refer to all of the approaches to the individual for therapeutic purposes. I want to drive home the enormous significance which the mental attitude of the patient may have because of his emotional orientation towards his body at some particular and critical period in his life, such as during an illness, and the relation of this situation to what I have called, for lack of better names, the two great instincts of life and of death, which perhaps might be more elegantly referred to as the instincts of Eros and Thanatos.

I can not close without just a few remarks upon what I conceive to be the great concepts that are coming into being and which, if they do not revolutionize medicine, certainly will change its structure to a very great extent. Dr. Peabody is quoted as having once said that: "What is spoken of as a clinical picture is not just a photograph of a man sick in bed. It is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes and fears." Such a statement as this is not only the wise saying of a wise physician, a statement of facts to which everybody renders lip service, but a statement of the way the patient is actually coming to be regarded by physicians who practice medicine in accordance with the highest standards of the present day and age. But even such a statement falls very far short of the facts as we are able now to visualize them. I speak of the patient from the points of view of what I call his "levels of integration." So I speak of the symptoms at the laboratory level, the symptoms at the level of the general medical examination—the state of the internal organs, and then because of our particular interest in the nervous system I speak of the symptoms at the level of integration of the nervous system, then at the level of psychological integration, and finally at the level of social integration. Each one of these levels comprises an infinitude of adjustments, conflicts and their solution, or, on the contrary, compromises or failures of all sorts and descriptions in every region. And the sum total of this infinitely complicated organism is the result not only of the integration at all these levels, of the relation of organ to organ and of function to function, but of the relation of the organism to his fellows in the social group to which he belongs. It is a picture of bewildering complexity, and yet there is slowly coming about this way of looking at the human being, which has been dignified by the title, "The Biology of the Person." It is, I think, the path along which the future of medicine will develop.

I have illustrated only briefly and inadequately one little aspect of this complex. I have called your attention to the play between the forces that are making for life and those that are making for death, because I thought that these were of immediate and significant importance; but in order that medicine may proceed along the path which has been opened up by the concept of the "biology of the person" it is essential that much clearing away of underbrush should take place, and that we should begin to stop using words like "disease" and "health," for example, until we have analyzed them and worked out their true meaning and significance. I doubt not that many physicians would pause if they were asked for a definition of disease, and surely that goes to the heart of the whole matter. There has grown up an enormous body of knowledge about what once was called "disease." We still go on speaking of disease without having redefined it in the sense of this accumulated knowledge. We have got to look to our definitions unless we want to find ourselves suddenly in a morass of words that have lost their meanings. Thomas Sydenham said nearly two hundred years ago: "A disease, in my opinion, how prejudicial soever its cause may be to the body, is no more than a vigorous effort of Nature to throw off the morbific matter, and thus recover the patient."

In many respects we are not yet as far advanced in our thinking about sick people as Sydenham was when he wrote that sentence, but today we are capable of giving that sentence vastly greater meaning than Sydenham ever dreamed of.

HOUR-GLASS STOMACH: A REVIEW

W. Warren Sager, M.D.

Associate in Surgery, George Washington University School of Medicine

The following review of the literature has been made because of the lack of recent studies dealing with more than a few of the many sides of this interesting condition. The review as written does not cover more than a part of the immense literature on the subject but does attempt to cover practically all phases.

Morgagni, according to Patterson, gave the first accurate description of hour-glass stomach and, according to Spannus, had knowledge of three generations of a family suffering from this condition.

Types

Hour-glass stomach is a deformity that may be either functional or organic.

Organic hour-glass stomach may be acquired or congenital according to some authors, while others doubt the occurrence of the congenital type. Moynihan states that but one authentic case of congenital hour-glass stomach has been reported. According to Goodman and Eusterman it would be better to speak of intra- and extra-uterine acquired hour-glass stomach. That there is such a condition as gastric ulcer of the fetal stomach is supported according to Goodman by a case of Godhart which died 30 hours after birth, of hemorrhage from a gastric ulcer. According to Eusterman, Sandifort's case of an hour-glass stomach in a fetus is not conclusive support of the congenital theory since there "is undoubtedly such a condition as fetal ulcer." Discussing Sandifort's case, Moynihan states that every writer has referred to this case as a well marked example of congenital hour-glass stomach but that he "declined to admit that there was any warrant for considering this an hour-glass stomach." Many reports of other cases have been made supporting the congenital theory and aroused considerable controversy. An interesting case was reported in 1929 by Corcan, Chaussinand and Stolz of a child two years of age who had an hour-glass contraction of the stomach as well as a partially occluded pylorus resulting from the presence of a tissue diaphragm, and other anomalies of the gastro-intestinal tract. It has been suggested that congenital hour-glass stomach might result from an imperfection of development and that it is an instance of atavism; that there is an analogy between such a deformity and the normal bifid stomach of certain rodents and the pouched stomach of ruminants. According to Goodman these and other theories not mentioned here were shown to be based upon insufficient evidence.

Causes

A summary of the causes of hour-glass stomach was given in 1914 by Eusterman, who stated that the great majority of hour-glass stomachs are the result of an intrinsic ulcerative process. Other causes given are postoperative adhesions following excision of a gastric ulcer, compression by an extrinsic tumor, congenital bands or fistulas and the ingestion of corrosives. Spasm of the gastric musculature and tight lacing are given as minor causative factors in the production of hour-glass deformity. The importance of spasm, induced by ulceration, as a causative factor is stressed by Moynihan and C. H. Mayo. Moynihan states that "such constantly recurring spasm must lead to hypertrophy." C. H. Mayo states that "probably a combination of ulcer and spastic contraction ordinarily accounts for hour-glass stomach." Carman, in addition, also called attention to the hour-glass deformity, rarely found, due to benign tumor or sarcoma projecting into the lumen of the stomach, or to a hyperplastic form of tuberculosis involving the pyloric end of the stomach. Peptic ulcer is responsible for 85 per cent of organic hour-glass stomachs and 50 per cent show some evidence of perforation according to Rivers and Bowers. Gastric syphilis probably ranks second and carcinoma third, according to Carman, carcinoma causing less than 1 per cent of the cases.

The occurrence of hour-glass stomach due to peptic ulcer more frequently in women than in men is interesting since it is contrary to the occurrence of gastric ulcer uncomplicated by this deformity, which occurs more frequently in men. In a large series studied by Luff, the percentage of occurrence of ordinary gastric ulcer in males was 66.2 per cent and in females 33.8 per cent. There were 65 cases of hour-glass stomach in the series studied of which 84.6 per cent were in women and 15.4 per cent were in men. Rowlands states that 80 per cent occur in females. Thomas in a series of 50 cases found only four cases occurring in men.

The percentage of occurrence of this condition in cases of gastric ulcer varied from 3.5 per cent in a series of 2,300 cases studied by Rivers and Bowers, to 10 per cent in a series of 645 cases reviewed by Luff. Balfour gave an incidence of 8 per cent; C. H. Mayo, 7.39 per cent; and Eusterman, 6 per cent. The opinion is voiced by some authors of a recent decrease in the percentage of occurrence of this deformity due to better medical treatment of ulcer and earlier diagnosis.

MORBID ANATOMY

All pathological descriptions are of a chronic ulcerative process associated with a great deal of scar tissue formation and a high incidence of perforation. Thomas states that in his cases "many ulcers had completely healed leaving a hard scar which in the process of the years had drawn to itself the adjacent areas of gastric wall so as to produce the contraction, many had unhealed ulcers, some with adhesions to the liver and pancreas and even the anterior abdominal wall." Rowlands calls attention to the occasional extension of the ulcer to the cardiac orifice causing esophageal obstruction. Acute hemorrhagic gastric ulcer rarely leads to hour-glass stomach according to Thomas. Balfour states that "the ulcer associated with hour-glass stomach has certain characteristic features. Apparently its healing power is high, and quite often evidence is found of healed ulcers in other parts of the stomach." In 31 out of 37 cases Eusterman found the location of the original ulcer to be situated on the lesser curvature. Of the remaining 6, 2 involved the greater curvature in the fundus of the stomach and 2 were located on the posterior wall. The most frequent site of the obstruction was in the pars cardiaca or media. C. H. Mayo and Patterson call attention to the practical importance of recognizing that the external surface of the stomach may give little indication of the serious constriction within. C. H. Mayo mentions a case report by Andrews in which contraction of the mucous lining of the stomach occasioned by a small gastric ulcer drew the mucous membrane together like a Houston valve of the rectum without external incisura. The small percentage of stomachs with this deformity resulting from syphilis is shown by Eusterman's series of 40 cases of luetic stomach found in a study of 6,000 proved cases of ulcer and cancer of the stomach. There were in this group of 40 only 9 cases of hour-glass deformity and only 3 gave symptoms of obstruction. Cases in which there were 2 constrictions instead of 1 have been reported by Patterson and Moynihan forming the so-called trifid-stomach. Eusterman found the lower loculus generally to be larger than the upper, although Roux and Berger according to Carman found the upper loculus to be larger than the lower one. The contracture in ulcer cases according to Downes is always in the transverse diameter. It is also most frequently at the expense of the greater curvature. Patterson, however, quotes 1 case figured by Schwarz in which the lesser curvature is drawn towards the greater.

SYMPTOMS

Pringle states that most cases present symptoms of pyloric obstruction with or without the addition of active ulceration. This occurs in one-third of the cases according to Rowlands. Thomas found 7 cases of pyloric obstruction in 50 cases studied. It is interesting to note the very low percentage of malignancy found in the groups of cases that result from peptic ulcer as pointed out by Thomas, Rivers and Bowers, and others.

The symptoms of this condition are the symptoms of the disease causing the deformity and those of the obstruction which occurs, the latter when well developed overshadowing the former.

All cases resulting from peptic ulcer of the stomach with few exceptions give a history of gastric trouble over a period of years. The average age of Eusterman's 37 cases was 45 years. In Luff's series the greatest incidence was between the ages of 50 and 60 years. Between 60 and 70 years there was a marked decrease, the least number occurring between the ages of 20 and 30 years. In a series of 40 cases of luetic infection of the stomach reported by Eusterman which included 4 cases of hour-glass deformity, the average time before gastric symptoms developed was 12 years. In a series of 8 cases of malignant hour-glass stomach reported by Eusterman there was an average duration of symptoms of 2 years.

The symptoms of this condition are pain, tenderness and a sense of fullness in the epigastrium, vomiting, dehydration, weakness and emaciation. If an ulcer is the cause of the deformity there may be hematemesis or perforation. If, as previously mentioned, the obstruction involves the cardiac orifice, symptoms of esophageal stenosis may occur. Gastric acids may be high, low, or absent. According to Rivers and Bowers, in those cases caused by peptic ulcer the symptoms do not vary from those of ulcer unless there is interference with peristalsis. Under such conditions there is a slight sense of fullness or perhaps some pain shortly after the ingestion of food, and small amounts of food and small amounts of acid gastric contents may be regurgitated. Obstruction may occur and usually comes on immediately after ingestion of food. Vomiting according to Pringle is the most marked and constant symptom. The quantities vomited are not as large as in pyloric obstruction and are more frequent. Pain, according to Eusterman, was variable in degree and present in all cases. In the cases which had perforated it was acute and often prostrating. In 15 of the 37 cases studied it was localized in the left epigastrium. General epigastric and posterior radiation were common. Tenderness was present at some time in all the cases and in 70 per cent while under observation. Pain occurred in one-half to 4 hours after eating. Relief was obtained by soda, food or vomiting in 95 per cent of cases. Pringle states that pain occurs within a few minutes to an hour after food is taken and is relieved by vomiting. He also states that there is nothing diagnostic about the pain except that a few patients complained of a squeezing or gripping pain in the left hypochondrium. Luff found pain present in 96.3 per cent of his cases or 53 cases, vomiting in 83.6 per cent, hematemesis in 23.6 per cent and hematemesis and melena in 3.6 per cent. Rivers and Bowers found hematemesis or melena, or both, in 31 per cent of their cases. Eusterman found hematemesis in 35 per cent and with associated melena in 24 per cent. Eusterman reports hyperacidity in 70 per cent of cases, and Luff in 16 per cent of cases. Luff reported that in 5.5 per cent of cases no free hydrochloric acid was found. Eusterman reported 7 per cent with achlorhydria. The above gastric acidities were reported for cases in which peptic ulcer caused the deformity. Eusterman in a series of 8 malignant cases found the average total acidity to be 25 and free hydrochloric acid 13. The combined acid averaged 12. There were only 3 cases of achlorhydria.

As the symptoms elicited frequently did not give a sufficiently clear picture numerous physicians developed tests with which to increase their accuracy in diagnosis. These were developed before the roentgenographic diagnosis reached its present state of perfection; they are summarized by Moynihan.

Signs and Tests

Wölfer's signs 1 and 2 are: (1) The loss of fluid during a lavage in the stomach, (2) the appearance during a gastric lavage of a sudden gush of foul smelling material. Von Eiselberg observed that in one of his cases that on distending the stomach a bulging on the left side of the epigastrium was produced; after a few moments this gradually subsided and there was a gradual filling up and bulging on the right side. Von Eiselberg also called attention to the bubbling, forcing, sizzling sound which can be heard when the stethoscope is applied over the stomach after distention with carbon dioxide. If the two halves of a Seidlitz powder are separately given and the stomach be normal or dilated, no loud sound is heard anywhere except at the pylorus; if, however, a constriction be present in the stomach a loud, forcible, gushing sound can easily be distinguished at a point 2 or 3 inches to the left of the midline. Moynihan gives a Seidlitz powder in two halves, having carefully examined the abdomen previously. This is followed in 20 or 30 seconds by an enormous increase in the cardiac end of the stomach, which in turn is followed by distention of the pyloric pouch in a few minutes. Schmidt, Monard and Eichorst have seen a distinct sulcus between the two pouches inflated with carbon dioxide. Ewald called attention to the fact that when the stomach is filled with water and examined by gastrodiaphany the transillumination is seen only in the cardiac pouch; the pyloric pouch remaining dark. The deglutable India-rubber bag of Turck and Hemmeter may be passed and distended. The bulging caused thereby is limited to the cardiac pouch which is to the left of the midline.

The above tests as summarized by Moynihan are at the present time of small value since the diagnosis of this deformity is made almost exclusively by X-ray examination. They were, however, of great value to the clinicians using them before the advent of our present perfected X-ray technic. Moynihan states that in his first 6 cases he was able to diagnose 1 but that in his last 9 he was able to diagnose 7 with certainty. This was written in the year 1904.

The hour-glass deformity of the stomach caused by organic lesions located in the stomach may also occur as a result of gastric spasm alone. Attention was called previously to the rôle played by spasm in intragastric lesions producing this deformity. According to Carman, spasm may be caused by lesions outside the stomach, such as duodenal ulcer and disease of the gall bladder or appendix. It has also, according to Carman, been noted in hysteria and other nervous states.

Much has been written about the "pressure hour-glass stomach," "cascade stomach" or the "cup and spill stomach." "The name cascade by which it is better known has been applied to that gastric deformity in which the posterior wall of the cardiac end of the stomach forms a definite pouch and becomes distended with a mixture before any descends to the lower pole." "The remainder of the stomach fills from the overflow of this pouch in waterfall fashion." The above description is given by Rendick and Connors who state that this condition is accompanied by symptoms which are diagnostic, a sense of distress or pressure or distention in the left hypochrondrium extending laterally and posteriorly. This sensation is continuous for periods, aggravated by constipation and relieved by expulsion of flatus or excavation of the colon. This symptom is a result of distention of the splenic flexure. After meals eructations and regurgitation occur. Cardiac palpitation may occur. The distress after eating is less after a large than a small meal. Relief is obtained by massaging the abdomen, moving about or assuming the prone position. The authors were able to produce this deformity by distending the splenic flexure with gas. They found that if the flexure was to the left of the stomach and not behind it the cascade stomach was not produced. According to the authors various other causes have been assigned by others for this deformity such as spasm with and without intrinsic lesion, adhesions and pressure from various sources. Macaigne and Baize state that they agree with M. Barrett that the essential cause is an excess of intragastric gaseous tension exercising itself on a weak stomach wall, and that external pressure from a distended colon, the spleen or a peritoneal tumor produce the deformity by increasing the intragastric tension; they suggest that swallowing of air is very important.

According to Carman, the pseudo hour-glass deformity is roentgenologically seldom difficult of differentiation and with one exception spastic hour-glass deformity from extrinsic causes can usually be differentiated from other forms of hour-glass deformity by the use of a belladonna test. The one exception is gastric spasm arising from duodenal ulcer. A few authors quoted by Carman did not get as uniformly good results with the test. The presence of duodenal ulcer could be confirmed or excluded by X-ray. If duodenal ulcer was present, according to Carman, an error might be committed because there was 4.5 per cent chance of a gastric ulcer also being present. According to Rivers and Bowers, if there appears to be inconsistency between the evidence in the roentgenogram and the symptoms of which the patient complains it would be advisable to try intensive medical treatment plus sedatives and atropine for 4 or 5 days and re-ray. If spasm then persists it will usually be found that the condition is organic.

Treatment

The treatment of organic hour-glass stomach is usually surgical, although medical management has been of value in selected cases. Treatment of functional hour-glass deformity is of course medical unless the cause of the gastric deformity is diagnosed as a surgical lesion.

Einhorn has reported some successful results in the medical treatment of this condition. The cases treated were cases in which surgery was contraindicated. As Einhorn states, it is comforting to know that in rare instances there is still a chance for recovery although surgery is impossible.

The surgical treatment is extremely varied in the operative procedures used. When no pyloric obstruction is present posterior gastrojejunostomy, in non-malignant cases, is very attractive according to Rowlands, since it neutralizes excessive gastric acidity. Moynihan states that when the constriction is within 2 or 3 inches of the pylorus, the pyloric pouch is small, not dilated and from the surgical point of view is negligible. Nothing more is necessary to effect a cure than a free outlet from the cardiac pouch, and this is afforded by a gastro-enterostomy. In patients whose condition will not permit long or severe surgical procedures Downes advises gastrogastrostomy or gastro-enterostomy, stating that they relieved the immediate condition but did not remove the ulcer of cicatricial tissue, and that this is not always necessary and may even be unwise. Pringle states that when partial gastrectomy is not feasible owing to adhesions around the distal sac or to the high position and small size of the upper sac, he believes that a posterior gastro-enterostomy into the upper sac is the best procedure and also that in cases where a posterior gastro-enterostomy is difficult he has no hesitation in performing an anterior gastro-enterostomy with or without entero-anastomosis. Lanos states that gastro-enterostomy alone made on the superior pouch is an operation to be condemned.

In non-malignant cases in which there is also a constriction at the pylorus a single gastro-enterostomy will not provide adequate drainage for the lower pouch. Moynihan states that if both pouches require to be drained a double gastro-enterostomy may be performed. Wier and Foote have been generally accorded the credit for suggesting this procedure. Moynihan takes a long loop of jejunum close to the flexure and unites it by two separate anastomoses to the two pouches. Walton states that it is an operation generally regarded as the one of choice but states that partial gastrectomy is a more satisfactory operation. Patterson commends the operation if there is an obstruction at the pylorus. Sturgeon recommends the operation in debilitated patients who are thought to be poor surgical risks.

Numerous objections have been raised to gastro-enterostomy as the means of treating this condition. Rowlands quotes Veyrasset as having reported in a review of 260 cases, 6 deaths resulting from draining the pyloric rather than the cardiac pouch. Stokes in discussing a report by Pringle stated that he had seen 2 cases in which the gastro-enterostomy was done on the pyloric pouch. Pringle condemns the use of a single gastro-enterostomy placed across the constriction and opening into both sacs. Moynihan explains the error of placing a gastro-enterostomy on the wrong sac as being due to an enlargement of the pyloric pouch resulting from obstruction at the pylorus, the lower sac then obscuring the upper one. Walton stresses the difficulty in some cases of doing a posterior gastro-enterostomy and states that an anterior gastro-enterostomy is not as good. Lanos condemns a gastro-enterostomy on the superior pouch. Rowlands condemns double posterior gastro-enterostomy as unsatisfactory, pointing out the chance of inadequacy in the opening through the mesocolon causing obstruction. Walton in addition to Rowlands' objection points out the chance of the loop causing undue pressure on the middle colic artery. Patterson reported an obstruction in a case where double gastro-enterostomy was done as occurring 3 years after operation.

Gastrogastrostomy, an operation first described by Wölfler, is commended by Rowlands as an operation of choice. It has the advantage, according to Walton, of having the opening made in normal stomach and the disadvantage of not treating the ulcer of relieving the pyloric obstruction. Downes recommends the operation when the pouches are large and can easily be approximated and when the patient is a poor surgical risk. Pyloroplasty should be added according to Downes, if there is retention in the pyloric pouch. Meyer performed gastrogastrostomy with the aid of the Murphy button in one case of a patient critically ill.

Gastroplasty, according to Moynihan, is an operation the rôle of which is very limited. It is applicable only to those cases in which a narrow stricture is present without induration, active ulceration or external adhesions. The cases to which it is suited are few and more successful operations can be practiced.

Kammerer in 1903 applied Finney's pyloroplasty, described in 1902, to hour-glass stomach successfully. This operation, according to Moynihan, relieves gastroplasty of many disadvantages. Rowlands does not approve of the operation.

Downes states that sleeve resection is the ideal operation for hour-glass stomach in cases in which the patient can stand a long operation, when the pylorus is patent, the adhesions not too extensive and the pouches fairly equal in size. Woolsey in discussing Downes' report approved the use of this operation when there was about 3 inches of the pyloric end of the stomach normal, while Lewishon stated that the vast majority of these cases are not cured by a mid-gastric resection. Balfour prefers either a sleeve resection or some type of partial gastrectomy if it can safely be done. Lanos objects to the sleeve resection because it is a long operation and does not prevent the ulcer recurring. Judd and Lyons in sleeve resections performed on 56 gastric ulcer cases which included 15 hour-glass stomachs reported an average decrease in gastric acidity and a cure of 70 per cent. The remaining cases were equally divided between those improved and those which were unimproved. Moynihan recommends the operation if the ulcer is small, the constriction narrow, the surrounding parts supple and free from adhesions to neighboring structures.

Moynihan states that partial gastrectomy is partially displacing other methods in this practice, using it whenever the ulcer is unhealed or is within an accessible area. It is used also in cases of malignant hour-glass contraction. Walton calls attention to the severity of the operation, and while recommending it for malignant hour-glass stomach states that if no evidence of malignancy is found an operation of this magnitude may be unnecessary and, if the cardiac pouch be small, extremely difficult. C. H. Mayo recommends either sleeve resection or partial gastrectomy. To Pringle as to Moynihan, partial gastrectomy when possible is the operation of choice. Lanos approves the method and reports a case of mid-gastric and pyloric obstruction treated in this manner. Rowlands states that sleeve resection or partial gastrectomy are usually unncessarily severe but are good when malignant disease is suspected.

C. H. Mayo mentions the use of the Devine operation in this condition, and Moynihan reported 1 case in which digital dilatation of the stricture was sufficient to cure the patient. Coffey treated one case of hour-glass stomach high up in the cardia by simple excision of the ulcer. This left a lumen in the stomach comparable to that of the small intestine. The patient was well and symptom-free 5 months after operation.

BIBLIOGRAPHY

Balfour, D. C.: Complications of Chronic Gastric Ulcer. California & West. Med., 1917, **27,** 177.

Carman, R. D.: Roentgenologic Aspects of Hour-Glass Stomach. Surg. Gynec. Obst., 1922, **27,** 426.

Chabrié, P. H. J.: L'Estomac Biloculaire. Faculté de médicine et de pharmacie de Toulouse, 1894, **34,** 31.

Coffey, R. C.: Surgical Treatment of Ulcers Along the Lesser Curvature of the Stomach. Surg. Gynec. Obst., 1910, **11,** 545.

Corcan, P., Chaussinand, R., and Stolz, J.: Estomac biloculaire organique avec sténose pylorique congénitale type. Rev. franc. de pédiat., 1929, **5,** 354.

Downes, W. A.: Hour-Glass Contraction of the Stomach. Surg. Clin. N. Amer., 1923, **3,** 343.

Downes, W. A.: Late Results of Midgastric (Sleeve Resection) for Hour-Glass Contracture of Stomach. Ann. Surg., 1922, **75,** 760.

Einhorn, M.: Geheilter Fall von scheinbarem Sanduhrmagen. Deutsche med. Wchnschr., 1927, **53,** 1689.

Einhorn, M.: Another Case of Apparent Hour-Glass Stomach Cured by Medical Means. M. J. & Rec., 1928, **128,** 575.

Eusterman, G. B.: Syphilis of the Stomach. Am. J. Syph., 1914, **2,** 205.

Eusterman, G. B.: Hour-Glass Stomach and Duodenum. J. Mich. M. Soc., 1914, **13,** 417.

Finney, J. M. T.: A New Type of Pyloroplasty. Bull. Johns Hopkins Hosp., 1902, **13,** 155.

Goodman, E. H.: Diseases of the Digestive Tract and Allied Organs, the Liver, Pancreas and Peritoneum. Progr. Med., 1912, **4,** 17.

Judd, E. S., and Lyons, J. H.: Resection of the Body of the Stomach for Ulcer. Report of a Series of Cases with End Results. Ann. Surg., 1922, **76,** 409.

Kammerer, F.: Hour-Glass Contraction of the Stomach. Ann. Surg., 1903, **37,** 281.

Lanos, J.: Un cas de sténoses médiogastrique et pylorique concomitantes. Bull. et mém. Soc. de chir. de Paris, 1928, **20,** 511.

Luff, A. P.: Collective Investigation into After History of Gastro-Enterostomy. Brit. M. J., 1932, **1,** 348.

Macaigne, M., and Baize, P.: Une variete particuliere de biloculation gastrique. Presse méd., 1926, **34,** 563.

Mayo, C. H.: Hour-Glass Stomach and Duodenum. Ann. Surg., 1925, **81,** 313.

Meyer, W.: Gastrogastrotomy for Hour-Glass Stomach. Ann. Surg., 1918, **68,** 97.

Moynihan, B.: Abdominal Operations. Philadelphia, W. B. Saunders Co., 1928.

Moynihan, B. G. A.: Remarks on Hour-Glass Stomach. Brit. M. J., 1904, **1,** 413.

Patterson, H. J.: Hour-Glass Stomach. Practitioner, 1911, **87,** 642.

Pringle, S.: Operation of Choice in Hour-Glass Stomach. Lancet, 1926, **1,** 1031.

Rendich, R. A., and Connors, J. F.: A Study of the Pressure Hour-Glass or Cascade Stomach. Surg. Gynec. Obst., 1924, **38,** 771.

Rivers, A. B., and Bowers, J. M.: Hour-Glass Stomach with Benign Gastric Ulcer. M. Clin. N. Amer., 1931, **15,** 129.

Rowlands, R. P.: Clinical Lecture on Hour-Glass Contraction of Stomach. Brit. M. J., 1931, **2,** 50.

Spannaus, K.: Zur Klinik des Sanduhrmagen unter Zugrundlegung von 34 Fällen. Beitr. z. klin. Chir., 1911, **75,** 261.

Stokes, M. H.: Hour-Glass Stomach. Lancet, 1914, **186,** 1111.

Sturgeon, C. T.: Hour-Glass Due to Ulcer of Lesser Curvature. S. Clin. N. Amer., 1932, **10,** 1165.

Thomas, W. T.: Observations on 50 Cases of Hour-Glass Stomach Subjected to Operation. Brit. J. Surg., 1921, **9,** 37.

Walton, A. J.: The Treatment of Hour-Glass Stomach. Surg. Gynec. Obst., 1919, **29,** 213.

Wölfler, A.: Ueber die Gastro-Anastomosa beim Sanduhrmagen. Beitr. z. klin. Chir., 1895, **13,** 221.

THE BONUS ARMY: HEALTH AND SANITARY PROBLEMS*

James G. Cumming, M.D., M.S., D.P.H.

Chief, Bureau Communicable Diseases, Department of Health, Washington, D. C.

The health and sanitary problems of the bonus marchers were many and varied. Our Health Department was interested in the prevalence of current illness, including the communicable diseases, the sanitation of the camps and the hygiene of the men. Our primary obligation lay, of course, in guarding against the spread of epidemic diseases from these camps to our citizens in Washington.

Following the first arrival of bonus seekers, the latter part of May, the number was augmented by hundreds daily; so that by July the city was occupied by from 12,000 to 15,000 men.

The first arrivals were permitted to occupy a government park along the Anacostia River, which became known as Camp Anacostia, where about 10,000 men were sheltered in a few tents and hundreds of shacks constructed by the men from reclaimed materials. As the number of invaders increased, a new site, far removed from the heart of the city was loaned by a sympathizer, and here was established Camp Bartlett, of about 2,000 men who were quartered in tents loaned by the National Guard.

---

* Read before the Society, April 5, 1933.

The Health Department looked with favor on the concentration of all the men in these two camps; the increasing arrivals, however, soon overflowed into vacant government-owned buildings on Pennsylvania Avenue in the heart of the city. These properties were in the wreckers' hands, and in every possible state of demolition. These were dilapidated structures from which all plumbing and lighting fixtures had been removed. Moreover, in most instances the water had been shut off at the curb.

SHELTER

But still the crowds poured in. New comers fashioned for themselves hovels and shacks from every conceivable material, including reclaimed lumber, discarded oil cloth, burlap blankets, tin cans pounded flat, and grass for thatched roofs, and a piano box, which provided the finder a ready built home, the envy of less lucky builders.

The concentration of population at Camp Anacostia was about 1,000 men per acre. For comparison it may be said that single dwelling areas in cities have an occupancy of 30 persons per acre and in row-house areas 100; while in an infantry regiment, which is a better comparison, for our purposes the occupancy is 300 men per acre. But at Camp Anacostia there was not only excessive crowding, 1,000 men per acre, but there were as well meagre facilities for the maintenance of hygiene and sanitation.

While in apartment houses the occupancy per acre of floor space is 60 persons, in certain of the government-owned buildings in the Pennsylvania Avenue area the occupancy by the bonus army was 750, and here too the hygiene and sanitary equipment was wholly inadequate. The excessive crowding in camps and billets together with the lack of protective hygiene and sanitation could not be endured for long without development of serious health hazards to both veterans and citizenry.

The wretched housing conditions of these men were such as would draw public condemnation had they prevailed at a mining camp or on a railroad construction job, but fortunately they were here for but two months, a period too short for a cumulative widespread outbreak of communicable diseases.

BEDDING

The bedding consisted of straw or grass ticks placed for the most part directly on the floor or ground, where they collected dirt, were seldom if ever washed, and following a heavy rainfall often became water-soaked. Some of the more ingenious men constructed wood bunks, while others secured discarded iron bedsteads and mattresses. There were no enforceable regulations requiring either the washing or sunning of the bedding. The lack of care of the bedding and its condition, the infestation in 5 per cent of the men arriving, as well as the gradual lowering of the camp morale and the endemic prevalence of typhus along the Atlantic Seaboard might perhaps afford a stage-setting for a possible outbreak of typhus.

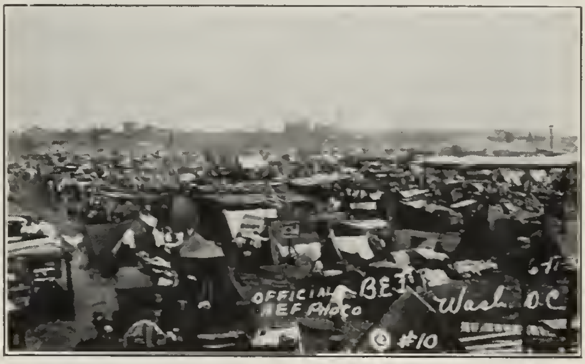


FIG. 1. SHACKS AND HUTS CLOSELY BUILT, ALL OVERCROWDED; 1,000 MEN PER ACRE

HEALTH DEPARTMENT ACTIVITIES

In the scheme of things, the Department of Health was charged with the maintenance of a high standard of hygiene and protective sanitation among the invaders. These measures at their best can, however, only curtail, not entirely prevent, epidemic diseases. But at the outset, it may be said that the invaders were not organized for the purpose of making a health demonstration. Their primary object was that of securing the bonus, together with food and shelter during the invasion period. All other requirements for the operation of an orderly, healthy camp were largely neglected. A high state of organization could not be expected, nor were the men wholly to blame for this, for they had been encouraged to assemble in Washington. Furthermore, they were recruited during a very brief period from practically every State in the Union, and many of them came under the delusion that they were to be cared for while here under usual army conditions.

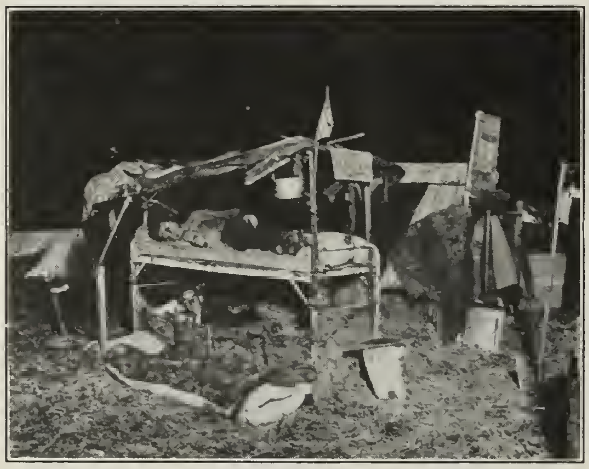


Fig. 2. The Last Bit of Usefulness Being Squeezed Out of an Old, Discarded Auto-top and Double-deck Bunk

The shack in the rear, 8 feet x 10 feet, made of boards, oil cloth and tar paper, sheltered 7 men.

To add to the difficulties of the health and sanitary problems, the situation was further complicated by its political, economic and social phases. There was strong political support both for and against the bonus cause. Unemployment throughout the country tended to engender a sympathetic feeling for the men. An attitude of helpfulness and sympathy on the part of the citizenry for the soldier prevailed as in 1918 to an extent that these veterans were given such wide freedom of the city as to be permitted even violation of minor police regulations as well as certain sections of the sanitary code.

The dispensaries in the various camps were established by the bonus seekers themselves. Some veteran who had served in the medical corps appropriated a tent, reclaimed some lumber for flooring, hoisted a borrowed Red Cross flag, and inveigled the nearest drug store into donating some adhesive tape, gauze, iodine, compound cathartic pills, and then announced the dispensary open for business. Such dispensaries became the headquarters for the physicians detailed to the various camps from the Health Department. The work of these doctors was to prescribe for illness, direct the men in the treatment of patients, arrange for transportation and care of emergency cases in city hospitals, and constantly to watch for indications of communicable disease.

The treatment of these veterans soon so overtaxed the local hospitals that it became necessary for the Veteran's Bureau to establish a hospital at Fort Hunt for the men, while the women and children were treated in local institutions.

The annual hospital admission rate for the men was approximately 250 per 1,000 and for children 600 per 1,000. These rates are excessive for the seasonal period under consideration, and had the occupation been prolonged it is reasonable to assume that the hospital facilities would have been taxed beyond capacity.

In addition, daily inspections of all camps were made by sanitary inspectors from the Health Department.

These two details—the physicians in attendance and the sanitary inspections—were the ground-work on which the Health Department based an ever widening circle of activities; from investigating outbreaks of food-poisoning to hospitalizing mothers in childbirth.

Among the problems requiring the attention of the Health Department were those concerned with drainage, garbage disposal, water supply, toilet facilities and the food.

Drainage

Certain camps had natural drainage, but Camp Anacostia occupied a low, flat area of about 60 acres which became a veritable mudflat after each rainfall. At Camp Bartlett, the hilly contour of the land had resulted in the washing of a deep gully in the rear of the camp which was regarded by the campers as a desirable location for pit latrines. On two occasions latrines were dug in this location, but they were discovered and abandonment was enforced before a heavy rainfall could cause their overflow and distribution of the contents throughout a populous area.

Garbage and Refuse

During the earlier days of the occupation by the bonus-seekers, the garbage and refuse was disposed of by burning and burying. However, there was but a 28-inch ground-water level at Camp Anacostia, which necessitated shallow ditches, and the grounds around the mess-halls soon became polluted and offensive, especially in warm, heavy weather. Finally, this nuisance became so common throughout the camp that arrangement for the removal of garbage was made by the District Garbage Collection Service.

In the Pennsylvania Avenue area, garbage collection was never satisfactory because there was not only a great turn-over of the occupants there, but a continual shifting of separate units, so much so that an organized, fixed system of collection was practically impossible.

Although the campers did the best they could, it is to be pointed out that ordinary standards could not be met because of lack of organization and centralized authority among the men.

Water Supply

The source of water for this army of bonus-seekers was the purified supply of the District, which eliminated any possibility of water-borne infection from this source. The supply was run for a distance of several blocks to the edge of the camp through a double line of fire-hose supplied with shut-off nozzles. But the method of its handling in the camp proper was most primitive. It was carried into the camp in every conceivable container, and no care was exercised in its protection against pollution at the many camp messes.

No preparation had been made by those organizing the invasion to provide facilities for bathing and hand-washing so essential to health and cleanliness of body. Less than 20 shower baths were available for the two main camps of 14,000 men, 1 shower for each 700 men.

There were practically no bathing facilities available for the 4,000 men, women and children billeted in the populous area of the city. During the last few weeks of the occupation, however, about a third of these units were able to construct crude, temporary showers.

While there was provided for the camps an abundance of pure, safe water for drinking and cooking, attention is called to the contrast between the inadequacy of facilities for hand-cleanliness and bathing in these camps and the abundance of such provisions as a means of reducing health hazards in all camps during the World War. From this point of view, it is perhaps fortunate for the bonus army that it occupied Washington for but two months, for it was found that among 1,500 men who were given physical examinations upon their arrival 5 per cent were infested with vermin, and furthermore, it became evident that the men did not maintain their average standard of cleanliness during their stay here. Such conditions, the result of temporary environment, would probably have led to epidemic outbreaks of either insect- or saliva-borne diseases.

Toilet Facilities

The lack of organization in the bonus army for the care of its men applied to toilet facilities as well as to other public-health requirements. The arrival of hundreds of men daily at Camp Anacostia necessitated the emergency measure of using pit latrines, which are prohibited at camp sites by the Sanitary Code of the District of Columbia. Without discredit to the men, it may be said that these temporary pit latrines were neither constructed nor supervised in a manner creditable to good organization. The pits were open wide to the flies of the neighborhood. The coverage consisted of side walls on only two sides. They were but seldom burned out with oil, and only infrequently covered with earth.

Finally, the Sewerage Department of the city constructed a sanitary flush latrine on the edge of the camp. But this only partly fulfilled the requirements of this unorganized, undisciplined camp, for on the far borders the ground pollution with human excrement was decidedly in evidence.

The most unsatisfactory situation arose in the center of the city where 4,000 invaders occupied buildings which were in a state of demolition. The men billeted in these structures, as well as in the several hundred temporary huts and shacks in this area, had access to toilets in public buildings, gas stations, police stations and public comfort stations. But owing to the large influx of men, the overcrowding of these public facilities, their remoteness from some of the billets, and lack of respect for decency on the part of a few men, the basements of some of the occupied buildings became soiled with human excrement. In fact, it became necessary to nail up all openings in basements and all unoccupied buildings in order to break up the practice.

FOOD

There were but meagre funds for the purchase of food supplies. Necessarily, the invaders, for the most part, lived off the community and the surrounding country. Despite the fact that practically all food was eaten as soon as prepared, there occurred daily from 20 to 200 cases of dysentery during the last three weeks of occupation. The clinical picture of these cases, as well as the laboratory investigations, indicated that they were for the most part infections of the bacillary dysentery type. The distribution of this infection would appear to have been brought about by flies, through food, by personal contact, and by ground pollution. There was no typhoid problem, and this can perhaps be explained by the safety of the water and milk supplies, the absence of those prepared foods which are commonly responsible for transmission, and perhaps the immunization of these men by vaccination during the War.

Within the last half century Washington had its malaria problem. But here again the bonus marchers were fortunate in having the benefits of routine public-health work which through the years has erected a bulwark of protection for the citizenry as well as its guests. Picture if you will the bonus army of 15,000 souls bivouacked in a malaria-infested area, provided with a polluted and untreated water-supply and devoid of vaccination against typhoid. Under these conditions, Camp Anacostia would have presented a picture similar to Chickamauga of Spanish-American War fame with its excessive mortality from both typhoid and malaria.

The suddenness of the invasion, the lack of centralized authority and organization in the ranks, the inadequacy of funds to provide the necessary sustenance, shelter and sanitary equipment, the lack of organized effort in hygiene and sanitation, the continual turnover in the personnel of the camps with its shifting of responsibilities, all operated against the building-up of a systematic program of health. But to offset these negative factors, it must be pointed out that the barriers which public health has erected during the last 25 years temporarily safeguarded our people, both citizens and invaders, in this serious emergency.

FULL-TERM ABDOMINAL PREGNANCY*

REPORT OF A CASE

JOSEPH J. MUNDELL, M.D.
Professor of Obstetrics, Georgetown University School of Medicine

Advanced abdominal pregnancy is such a rare condition and so infrequently seen that its proper management is not always clear. When to operate and what to do with the placenta are questions deserving serious consideration. I am reporting the following case with the hope that it will help to bring about a better understanding of the best way to handle this condition.

REPORT OF CASE

The patient, a colored woman aged 21 years, visited the prenatal clinic at Columbia Hospital for the first time on April 15, 1930, complaining of pain in the lower abdomen.

---

* Read before the Society, February 22, 1933.

Her general health had always been good. She had been married 3 years but had not been pregnant. Menstruation had been normal up to and including January, 1930. She suspected that she was pregnant, the last normal period having begun on January 17, 1930. Once in February and once in March she had had a scanty bloody 'show' each time lasting only an hour or so. She was a well developed and well nourished young woman. Upon bimanual examination of the pelvis the uterus was found to be slightly enlarged, soft and retroverted. The patient was told that she was pregnant and that the expected date of confinement was October 24, 1930. On May 27, the date of her second visit, she said that she had been confined to bed for 2 weeks with pain in the lower abdomen, being treated by a physician for inflammation. The uterus was enlarged to the size of a 3 months' pregnancy; there was tenderness in both adnesia and she was annoyed with a white vaginal discharge. The discharge was negative for gonococci and the blood Wassermann reaction was negative. At the monthly visits in June, July and August pregnancy was progressing satisfactorily. On September 2, the patient was admitted to the hospital because of abdominal pain. The intern, Dr. J. D. Wynkoop noted: "Abdomen distended, thought to be due to fluid in the peritoneal cavity; head easily palpated under the umbilicus; small parts not felt; fetal heart not heard; soft mass felt in the cul-de-sac. Impression: abdominal pregnancy." The next day the patient was examined by 3 members of the staff. They concurred in the diagnosis, but because the pains had entirely subsided and the general condition was good, the patient was allowed to return to her home. At revisits on September 9, 16 and 30 her general condition was good. It was not until September 30, that the fetal heart sounds were heard. On October 1, *X*-ray and fluoroscopic examinations showed a fetus in cephalic presentation with the back to the left and with apparently a large amount of free fluid in the peritoneal cavity. On October 7, the fetal parts seemed to be just under the abdominal wall, and the umbilical cord could be grasped through the abdominal wall and its pulsation felt. The uterus was thought to be felt in the pelvis and there was a large boggy mass in its left side. The diagnosis was concurred in by several members of the visiting staff, and the woman was admitted to the hospital. Urinalysis was negative, hemoglobin 60 per cent, red cells 2,830,000, and white cells 8,900 per cubic millimeter of blood. On October 12, she received a transfusion of 500 cc. of blood. Upon opening the abdomen on October 13, a thin, transparent amniotic sac was encountered, with widespread adhesions. The sac was opened and a living child removed. The placenta was large and was attached to the top of the uterus, the left broad ligament, the parietal peritoneum and loops of bowel. It was plain that attempts at removal would be attended with grave risk, and therefore it was not disturbed. The cord was tied with catgut and cut close to the placenta, which was left in situ. As much of the sac as possible was removed. The abdomen was closed without drainage. The baby, a girl weighing 7 pounds, 4 ounces, was normal except for a slight flattening of the face and 2 supernumerary fingers. Its respiration was labored and it died at the end of 3 hours. Autopsy revealed the cause of death to be pneumonia. The mother made a good recovery. Her evening temperature on the day of operation was 101.4°F.; thereafter it was not above 100. She was discharged from the hospital the 21st day. In October 1931, the patient was in excellent health, being steadily employed in a baker's shop. Examination showed a doughy mass in the left side of the pelvis only half as large as at the time of her discharge from the hospital. In June 1932, a thickened mass considerably reduced in size, was still present in the left side of the pelvis, but the patient's general health was excellent.

REVIEW OF THE LITERATURE

In 1902 Sittner reported 179 cases of advanced abdominal pregnancy. Schauta in 1906 reported 241 cases, and Beck collected 262 advanced cases with living babies occurring between 1908 and 1919. From 1919, the date of Beck's article, to the present date I have collected 120 cases (see Table). The series, however, includes only 49 live babies.

TABLE

DATA OBTAINED FROM 120 CASE REPORTS COLLECTED FROM THE LITERATURE FROM 1919 TO THE PRESENT BY MUNDELL

Total number of live babies	49
Normal	41
Deformed	8
Normal dead babies	34
Deformed dead baby	1
Macerated babies	28
Mothers recovering	98
Maternal deaths	22
Full-term or near-term pregnancies	61
Normal live babies	31
Normal dead babies	13
Live deformed babies	7
Dead deformed baby	1
Macerated babies	9
Maternal deaths	14
Premature pregnancies, $6\frac{1}{2}$ to 8 months	18
Normal live babies	10
Normal dead babies	3
Deformed live baby	1
Macerated babies	4
Maternal deaths	6
Post-mature pregnancies, 10 to 22 months	36
Normal babies	16
Macerated babies	14
Mummified babies	3
Development not mentioned	3
Maternal deaths	4

DIAGNOSIS

The diagnosis of abdominal pregnancy is not easy. In this series of 120 cases there were only 45 correct diagnoses, and of these some were only tentative. It is said that the fetal parts are superficial and are easily palpated. This may be true, but it is also often true in cases of normal uterine pregnancy with a thin abdomen and thin uterine wall.

In most of the cases reported in which X-rays were used, the writers expressed the opinion that X-ray did not aid in the diagnosis. In a few cases X-ray films demonstrated death of the fetus by showing distinct overlapping of the sutures and fontanels.

When the evidence points strongly to abdominal pregnancy, diagnosis may be confirmed by injecting the uterus with lipiodol and taking an X-ray film; the uterus will be shown to be empty and the fetus out in the abdomen. However, unless the diagnosis is quite well established, and the patient is near term, one would hesitate to do this. Four cases in which this has been done are recorded by Rucker and Whitehead, Mendenhall, Osborn, and Titus and Eisaman. In our case this procedure was considered, but because the diagnosis seemed to be so positive, and because even the slight risk attending its use might have jeopardized the chance of delivering a live baby, it was not followed.

In 46 reports there was a history of symptoms indicating tubal abortion during the first trimester. Many patients complained of vague abdominal pains throughout pregnancy; in many others pregnancy seemed to proceed quite normally. In practically all of the postmature cases there was a history of spurious labor at or near term. Several writers record attempts at induction of labor. Only a few mention the Wassermann test as having been made, and in only 5 cases was it said to be positive. In only 10 reports is there noted a history of previous pelvic infection.

Solomons-Bethel gives a very interesting history of the treatment of abdominal pregnancy. At first it was seen only postmortem. Later, treatment was always postponed until after the death of the fetus, and at one time gynecologists were interested in finding the best infanticide. One advocated injecting atropin and strychnine into the sac, another urged morphine, while others suggested the electric current. One also inoculated the patient with syphilis in order to kill the fetus. Generally speaking the results of these measures were disappointing.

MALFORMATION OF THE BABIES

The earlier writers, Sittner, Werth, Schauta and Von Winkel, all state that at least 50 per cent of the babies were malformed if not monsters. Since then in all text-books the same statement is made. Beck, the most comprehensive reporter for the last 25 years, makes no mention of the development of the babies It would seem from Mall's work that the previous writers' statements would hold true, yet it seems strange that in this series of 120 cases there were only 9 reports of gross malformation, 7 full-term, live babies, 1 full-term, dead baby and 1 live baby at 8 months.

Several reports state that the face or head showed some flattening, evidently due to pressure against the pelvic bones; this, however, soon disappeared. In nearly all other reports, especially those of live babies, the writers plainly state that development was normal. In the case of macerated babies the development naturally is not mentioned. Dr. J. Thomas Kelley of this city, who has had an unreported case, says that no evidence of abnormality was shown until the boy, when grown, entered upon the study of medicine.

INTERESTING CASE REPORTS

Webb, Condit, and McMillan and Dunn each report a case of abdominal pregnancy twice in the same patient. McMillan and Dunn, Von Schubert, and Bowers report abdominal pregnancies following supravaginal hysterectomy. Wren operated in the patient's back yard in Alabama under a large sweet gum tree because the hospital for colored patients was closed, the mother and her normal full-term, live baby both recovering. Gilliott reports an 8-months' abdominal pregnancy, coincident with a full-term, uterine pregnancy, which occurred 4 years after the death of the abdominal fetus.

The mother recovered. Walters reports a mummified baby discovered 11 years after its death, with 3 normal confinements intervening. Darley also reports a full-term, macerated baby found 12 years after its death, with 3 normal confinements intervening. A calcified fetus discovered 33 years after its death is recorded by Letoux. Titus and Eisaman report a calcified fetus remaining in situ for 40 years after its death, the patient dying following operation. Smith reports a woman aged 94 years with a calcified fetus found 60 years after its death. Kramer in 1916 reported a case of abdominal pregnancy in which X-ray demonstrated a full-term fetus; operation was refused and in 1923 X-ray showed the fetus to be mummified, the woman, in the mean time, remaining in good health.

MANAGEMENT OF THE PLACENTA

One of the two major problems in the consideration of advanced abdominal pregnancy is the proper handling of the placenta. In 32 cases the placenta was so situated on a broad pedicle that it was very easily removed in its entirety without grave danger of hemorrhage. In 11 cases the placenta was so attached to the uterus that it could be removed by doing a hysterectomy. That great difficulty was experienced in attempting its removal was mentioned by 38 authors. The whole placenta was left in situ with packing in 12 cases with the loss of the mother in 5 cases. In all cases in which great difficulty was encountered in removing the placenta, packing was, of course, necessary, and practically all the women surviving had long, stormy convalescences.

Besides our case, in which the placenta was left in situ, there are 5 similar cases on record. Jewett reports such a case. Two years later he operated upon this patient for an intercurrent condition, but found no traces of the placenta. LeDoux, Wilcox, Cornell, and Holden each report a case managed in like manner. LeDoux's patient died within a few hours from hemorrhage; the others made good recoveries.

It was the custom of early Italian operators, says Beck, to leave the placenta without packing, and in this country Charles McKnight, of New York, reporting a case in 1790 commented upon the impropriety of removing the placenta. Beck placed about two-thirds of a 500 gm. human placenta in the abdomen of a dog, and 2 months later when he again opened the abdomen there was no vestige of the placenta. Rowland, in reporting a case likewise comments upon the advisability of leaving the placenta without packing. In our patient operated upon in October 1930, there was a sizable mass in the left abdomen when she was discharged from the hospital 21 days later. In October 1931, the mass had shrunk to about half its size, and in June 1932 it was still smaller. In the meantime the patient's general condition remained excellent.

Where the placenta is attached by a broad pedicle allowing extirpation, certainly its removal is indicated, but where it is so situated that its separation is most likely to be attended with difficulty and risk of grave hemorrhage, the sensible management is not to attempt its removal at all, the abdomen being closed without drainage.

WHEN TO OPERATE

The other major problem is when to operate. Sittner, one of the earliest writers on the subject, advocated keeping the patient under observation and waiting until near term. De Lee in his text-book says this is folly, that the operation should be performed immediately upon making the diagnosis. Likewise in William's text-book the same opinion is expressed. Beck suggests that the 38th week is the ideal time for the safety of both mother and baby, providing, of course, no untoward symptoms develop previously.

Sane management of abdominal pregnancy depends a great deal upon the behavior of the individual patient. In the first place, correct diagnosis is extremely difficult. With a case in which the diagnosis seems reasonably certain, immediate operation is indicated if distressing symptoms arise. However, with a patient such as ours when the diagnosis is made late and untoward symptoms have not developed, a live baby may be obtained with safety to the mother. The 38th week, for a case of this description, seems a sensible time for operation; after that, spurious labor may ensue with danger of death for the baby and hemorrhage for the mother.

One should hesitate to submit a patient to a uterogram when the diagnosis is only suspected, in the 7th or 8th month for instance, and when distressing symptoms are not present. When the diagnosis is reasonably certain, a uterogram for confirmation would be of interest and value.

SUMMARY AND CONCLUSIONS

1. A case of full-term abdominal pregnancy is reported in which a practically normal live baby was obtained and in which the mother recovered, the placenta having been left in situ and the abdomen closed without drainage.
2. Since the statement that at least 50 per cent of all mature babies in abdominal pregnancies are grossly malformed is incorrect, therefore if the mother's condition warrants, operation should be deferred until near term, in the best interest of both mother and baby.
3. If the attachment of the placenta is widespread it should be left in situ and the abdomen closed without drainage.

BIBLIOGRAPHY

Beck, A. C.: J. A. M. A., 1919, **73**, 962.
Bowers, R. J.: Penn. M. J., 1929, **33**, 69.
Condit, W. H.: Am. J. Obst. & Gynec., 1921, **2**, 645.
Cornell, E. L.: S. Clin. North America, 1931, **11**, 189.
Darley, W. W.: Brit. M. J., 1931, **1**, 582.
Gilliatt, W.: Proc. Roy. Soc. Med., 1919, **12**, 177.
Harrar, J. A.: Bull. Lying-In Hosp., N. Y., 1928, **13**, 262.
Holden, R. T., Jr.: Personal report.
Jewett, W. A.: Am. J. Obst. & Gynec., 1923, **5**, 176.
Kelley, J. T.: Personal report.
Kramer, E.: Fortschr. a. d. Geb. d. Rontgenstrahlen, 1925, **33**, 204.
LeDoux, L. A.: Am. J. Obst. & Gynec., 1926, **11**, 395.
Letoux: Gaz. Méd. de Nantes, 1911, **29**, 528.
Mall, F.: Publication 221, Carnegie Inst., 1915, p. 104.
McKnight, C.: M. J. & Rec., 1929, **130**, 281.
McMillan, W. A., and Dunn, R. H.: Surg., Gynec. & Obst., 1921, **33**, 199.
Mendenhall, A. M.: J. Indiana M. A., 1929, **22**, 349.
Osborn, G. R.: Am. J. Obst. & Gynec., 1930, **20**, 98.
Rowland, J. M. H.: Surg., Gynec. & Obst., 1926, **42**, 50.
Rucker, M. P., and Whitehead, L. J.: Am. J. Roentgenol., 1928, **20**, 431.
Salatich, B. P.: Am. J. Obst. & Gynec., 1926, **11**, 420.
Schauta, F.: Lehrbuch der gesamten Gynäkologie, 1906, p. 407.
Schumann, E. A.: Gynec. & Obst. Monographs, 1923.
Scott, W. A.: Am. J. Obst. & Gynec., 1928, **16**, 699.
Sittner, A.: Arch. f. Gynäk., 1901, **64**, 526.
Smith, H. G.: J. A. M. A., 1912, **58**, 1114.
Solomons, B.: Tr. Roy. Acad. M. Ireland. 1916, **34**, 158.
Titus, P., and Eisaman, J. R.: Am. J. Obst. & Gynec., 1932, **23**, 217.
Von Schubert, G.: Zentralbl. f. Gynäk., 1927, **51**, 3238.
Von Winckel, F.: L'Obstetrique, 1911, p. 493.
Walters, H. S.: China M. J., 1931, **45**, 782.
Webb, M. V.: Lancet, 1928, **1**, 230.
Werth, S.: Handbuch d. geb., 1904, **11**, 2.
Wilcox, L. D.: Canad. M. A. J., 1930, **23**, 60.
Wren, E. B.: South. M. J., 1920, **13**, 746.

DISCUSSION

Dr. Daniel Davis: The first authentic record of a woman surviving laparotomy for the delivery of a child is that by Jacob Nufer in Switzerland in 1500, who so delivered his wife. In all probability this was a case of abdominal pregnancy rather than true Cesarean section, for the woman survived to have 5 succeeding normal labors. Mercer and St. Maurice in 1610 were the first to maintain the possibility of a primary ovarian pregnancy. This hypothesis later was strongly opposed by Bland Sutton, Tait and Webster, but a case of primary ovarian pregnancy was conclusively demonstrated by Van Tussenbroek microscopically in 1899. Dr. Mundell has thoroughly reviewed the literature. Many of the reports have been most bizarre, quite paralleling some of the astonishing records of stone in the bladder before operation was common. While primary ovarian and abdominal pregnancies are now well recognized, many of these cases are undoubtedly extruded tubal pregnancies or pregnancies in cervical stumps. It is worth noting that a number of primary ovarian pregnancies have been detected by astute pathologists when the condition was not suspected by the surgeon. In treatment I would not be so conservative as Dr. Mundell. We must remember that only a small number of cases reach term. These are the favorable cases in which there is little or no tendency to separation of the placenta. In Dr. Mundell's abstracted series of 120 cases only 34 per cent had normal, living babies. The one great danger before operation is hemorrhage, and we have no way of telling when this will occur. In most of the cases the placenta was unduly large. No attempt should be made to separate it. It should be excised only if the operation proves simple and rapid. It is a striking fact that although no operator has deliberately planned to leave the placenta in situ and to close the abdomen without drainage the cases so treated present by far the best results. It is a pleasure to congratulate Dr. Mundell on the very satisfactory conduct of this case.

PERFORATED DUODENAL ULCER

A Summary of Fifteen Cases

José G. Lewis, M.D.
Washington, D. C.

At the Annual Meeting of the Society in 1932, I reported 3 cases of perforated duodenal ulcer for which I had operated. The points of interest were that in all 3 cases there was a history of recent alcoholic intoxication and that all 3 patients were seen within a period of 23 days. I had no proof that the immoderate use of alcohol was an etiologic factor but I did suggest that the alcohol, or the present-day undrinkable beverages, may have precipitated the accident in all 3 cases.

In the months that have ensued since the report just referred to was read, I have operated in 12 additional cases of perforated duodenal ulcer. I would now like to summarize the entire series of 15 cases. My interest still lies in the clinical impressions, (1) that alcohol may have played a part in the causation of rather a large proportion of the cases, and (2) that the cases seem to have been of more frequent occurrence than would be expected in the service on which they were encountered.

Summary of Cases

The patients were all men between the ages of 18 and 45 years. The histories disclosed no definite cause of ulcer nor of perforation unless the immoderate use of alcohol to which 7 of the patients confessed can be considered etiologic. Three of the men had never noticed previous gastric disturbances. All of the perforations occurred in the anterior wall of the duodenum, about 3 inches (7.5 cm.) from the pyloric sphincter. Dr. Cajigas, who examined all of the removed tissue, did not find evidence of malignancy. Simple Penrose drains were inserted in all cases, mainly as a prophylactic measure against the formation of subdiaphragmatic abscess. The average stay in the hospital was 18 days. Thirteen of the patients recovered and have remained free of symptoms. Two patients died. One of them was brought to the hospital 3 days after the perforation had occurred, and death resulted from generalized peritonitis. Death in the third fatal case occurred 2 days after a Polya-type of resection and can be attributed to shock.

Type of operation. As a rule I do not favor the Polya operation, but, rather, excision of the ulcer, followed by posterior gastrojejunostomy, as performed by Judd. Sometimes the objection is raised that gastrojejunal ulcer may follow this operation, and such a sequela is reported to occur in from 2 per cent to 5 per cent of cases. However, the possibility of pyloric obstruction is eliminated. Excision of the ulcer apparently is a refinement that can be dispensed with, for Balfour has reported that hemorrhage occurred from the duodenal ulcer in only 1 case of 500 in which simple gastro-enterostomy was performed, and W. J. Mayo has stated that simple gastro-enterostomy gives almost complete protection from late hemorrhage. Convalescence after gastro-enterostomy is very favorable

Considerable discussion has arisen over the radical, subtotal resection, advocated in some German clinics. It has been said that this operation is followed by a smaller proportion of complications than any other procedure. However, the mortality from the operation seems relatively high. Strauss reported a mortality rate of 5.4 per cent. Moreover, the need for the radical procedure seems not to exist in this country as it does in Germany. Walters, who recently investigated the reasons why subtotal resection is favored in that country, discovered that German surgeons and American surgeons are dealing, for the most part, with different pathologic conditions. According to Walters, in Germany, "in practically every specimen associated with one or more duodenal ulcers, there were from 3 to 16 superficial yet definite ulcers in the antrum of the stomach. . . . . Most duodenal ulcers occurring in patients in this country are localized to the duodenum."

(*Continued on page 98*)

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D.
C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D.
Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1932–33

President	Harry A. Fowler, M.D.
1st Vice-President	Henry R. Schreiber, M.D.
2nd Vice-President	H. Gladys Kain, M.D.
Secretary-Treasurer	Coursen B. Conklin, MD.

"LET YOUR DOCTOR DECIDE"

Under the auspices of the Association for the Prevention of Tuberculosis of the District of Columbia, one very definite and tangible result of 25 years of continuous popular education on how to prevent tuberculosis is that a large number of Washingtonians, regardless of racial, economic or religious status, are now aware that this dangerous and communicable, but not hereditary disease, is ever ready to attack human life. However, they are also aware that it can be repulsed and defeated if certain precautions and proper care are taken. That much is a tremendous gain. It is a "running start" toward a far better and more hopeful basis of public opinion for the fight against tuberculosis which still confronts the community. Many of our people not only know that this disease is preventable but that it is curable when discovered and arrested in its early stages. Many, but not all, know that the most obvious danger signs of the presence of tuberculosis are fatigue, loss of weight and blood spitting. The knowing ones, when these symptoms appear, take no chances of more trouble ahead but seek the advice and help of a competent physician. In order to bring more and more people to this state of knowledge and to further protect the entire community from the existing dangerous sources of tuberculous infection, the Association for the Prevention of Tuberculosis here and throughout the country have conducted during April each year for the past five years an aggressive campaign of education to focus attention on the vital importance of early diagnosis or early discovery of signs of tuberculosis. Each year these agencies have centered public opinion on some one essential aspect of the problem of prevention. During the coming "Early Diagnosis Campaign" in April the dominant thought to be stressed by all of these organized health agencies throughout the country is well stated as follows: "Tuberculosis—From Whom Did He Get It? To Whom Did He Give It? Examine and Protect Every Contact." That is the slogan for the 1933 campaign which is carried on millions of posters and pieces of health literature for free distribution. In some of the literature this slogan appears under a picture showing a doctor in the act of examining an X-ray plate of the chest of a patient found to have signs of tuberculosis. This indicates that no diagnosis of this disease can be regarded as complete without an X-ray film of the chest and unless all of the purposes of the slogan are realized. Among the publications being distributed by the local association is a small booklet outlining the features of childhood tuberculosis, a copy of which is to be given free to every senior student of our recognized medical schools. Although the incidence of tuberculosis is steadily declining in the nation as a whole, it is not true of our own city of Washington at this time. During the past year the Health Department recorded 599 known deaths from tuberculosis. This figure is among the highest annual rates for this disease in the past 18 years. It represents an increase from 119 to 121 per 100,000 of population. That this condition is due to the high death rate from tuberculosis among our Negro population does not help matters. We must face this fact because these people are living and working in almost every branch of industry and in our homes. It only serves to emphasize the need of greater efforts to assist both white and colored elements of our community to know and to practice the necessary methods of prevention, all the more vital now in the presence of widespread unemployment and lowering of standards of living.

GROUP HOSPITALIZATION PLANS FOR PEOPLE WITH LIMITED INCOMES*

Group hospitalization plans have been instituted in a number of cities and are in contemplation in others including Washington. It is a subject in which the medical profession should be keenly interested because the hospitals and doctors have certain common interests that are inseparable. Furthermore, it is a problem in which organized medicine as represented by the American Medical Association and its constituent bodies and the American Hospital Association and its constituent bodies should coöperate not only to promote and safeguard their respective interests, but also to promote and safeguard the interests of the public.

For the information of the entire membership of the Medical Society of the District of Columbia, the committee appointed to study and make recommendations relative to the reports of the Committee on the Costs of Medical Care reprints in full the following recent recommendations of the Council on Community Relations and Administrative Practice of the American Hospital Association in regard to Group Hospitalization:

THE PERIODIC PAYMENT PLAN FOR THE PURCHASE OF HOSPITAL CARE

Introduction

Believing that group hospitalization offers a practicable method for the distribution of unforeseen hospital costs which are often burdensome and embarrassing to persons whose incomes are limited, the Trustees of the American Hospital Association requested the Association's Council on Community Relations and Administrative Practice to study the subject and to formulate recommendations on the subject for the guidance of hospitals and for the information and protection of the public. In compliance with this request the Council has prepared the following statement.

Object of the Periodic Payment or Group Hospitalization Plan

There are doubtless many persons who, while not able under ordinary circumstances to pay the cost of hospital care when overtaken by sickness, could and would pay from six to twelve dollars a year if by so doing they could be assured that their hospital bills would be provided for. Group hospitalization plans, properly developed, should enable many persons, for whom hospital service must now be provided out of taxes or from private charity, to carry their own load without hardship. The principal purpose of the plan is to enable persons of limited means who value their independence and do not wish to become objects of charity or to be deprived of needed hospital care to include hospital costs in their personal or family budgets. Group hospitalization plans should be established with this public service in view and not for the gain or profit of the promoters.

Reasonable Payments to Hospitals

Hospitals should be paid reasonable sums for services rendered to patients under group hospitalization plans; "reasonable sum" means a sum approximately equal to current maintenance costs. While the plan will benefit hospitals by broadening the base of hospital support, profit should not be sought by hospitals participating in the system.

Benefit to Physicians

The lightening of the subscriber's burden which this system provides when hospital care is needed makes it easier for the subscriber as patient to pay his doctor's bill, and to this extent the plan benefits physicians.

Hospital and Medical Standards

Group hospitalization should be so administered as to encourage high standards of medical care. The admission of a hospital to participation in the plan should indicate approval of the hospital's ethics, administrative methods, and professional standards.

Competition to Be Avoided

Participation by hospitals in group hospitalization should be coöperative rather than competitive. Group hospitalization or periodic payment plans should as far as possible include all hospitals of standing in the community.

Periodic Payment for Hospital Care a Long Recognized Need

For several years, even before the depression, the difficulty experienced by many patients in paying for hospital service and the difficulties of hospitals in collecting patients' fees suggested the need of a practicable method of enabling patients to budget their hospital bills. The present widespread interest in group hospitalization is, therefore, not accidental or of recent or merely temporary interest; on the contrary, it reflects a fundamental social need which has been recognized for a long time.

---

* Submitted for publication by the Committee appointed to study the reports of the Committee on the Costs of Medical Care.

Plans Already Established or in Process of Development

Group hospitalization plans have been instituted or are in contemplation in a number of cities, among them Dallas, Fort Worth, San Antonio, Houston, Shreveport, Louisville, New Orleans, Colorado Springs, Pueblo, Newark and Elizabeth, N. J., Chicago, New York City, Philadelphia, Brattleboro, Vt., St. Paul, Grinnell, Ia., and Rockford, Ill. The places mentioned are those in which non-commercialized plans have been or are being developed and do not include those in which plans have been initiated as profit-making enterprises by business promoters or "hospitalization corporations."

Essentials of a Periodic Payment Plan

The plan which the American Hospital Association's Trustees and Council had endorsed in principle is a periodic payment plan under which a large number of individuals contribute equal amounts to a common fund to be used for purchasing hospital service when needed. The participating hospitals, individually or as groups, guarantee to provide care, of the types specified in the agreement, for any enrolled contributor or member, and the proceeds of subscribers' payments (after the deduction of necessary and carefully controlled expenses of administration) are paid over to the participating hospital or hospitals in proportion to the service rendered.

Group hospitalization agreements provide for the rendering of certain services in return for payment at a specified annual rate, and are to be distinguished from insurance arrangements by which insurance companies collect premiums or dues, and make cash payments to policyholders to reimburse them for losses incurred through sickness.

Exclusion of Professional Fees: Relation of Physician and Patient

Group hospitalization plans as recommended by the American Hospital Association are intended to cover hospital charges only. The arrangement of professional fees between physician and patient is to be regarded as a private matter not affected by the plan; the plan involves no change in the pre-existing normal relationship between physician and patient.

Choice of Hospital by Subscriber

The group hospitalization plan should be such as to render its benefits available in any participating hospital selected by a subscriber to which his physician has access or is acceptable.

Admission and Treatment of Patients

A patient entitled to benefits under a group hospitalization or periodic payment plan should be admitted in the usual manner on the recommendation of his own physician and should be cared for by his physician under the regular hospital rules governing professional services. The plan should not require a hospital to change its established policies with reference to its medical staff or to kinds or medical classification of patients admitted.

Regularly Employed Groups Preferable as Subscribers

So far as possible the plan should be based upon arrangements made with associated groups of subscribers regularly employed. Physical examinations are not required where large groups are simultaneously enrolled.

In some of the more conservative plans the subscriber becomes eligible only after a definite period (one month to three months) of employment; the object of this qualification is to avoid abuse of the plan by individuals who might seek temporary employment solely for the purpose of obtaining hospital care.

Enrolment of Individual Subscribers

The enrolment of individual subscribers increases the cost of initiating and administering the plan and fails to develop a feeling of group solidarity, which is a valuable aid to the continued support and proper administration of the plan. If subscribers are individually enrolled they should be accepted only upon voluntary application and as a rule should pay a higher subscription rate in fewer instalments.

Extension of Benefits to Dependents

The extension of benefits to the dependents of an employed subscriber may be arranged for in one of two ways: one method is to enroll members of the subscriber's family as additional subscribers; the other is for the participating hospitals to offer a substantial discount (say $33\frac{1}{3}$ per cent) from the regular hospital rates to any subscriber who seeks hospital care for a dependent.

Waiting Period

Benefits usually accrue only after a waiting period (one to two weeks) from the time the membership begins. Where subscribers are individually enrolled, the waiting period should be somewhat lengthened.

Hospital Benefits

In so far as possible the annual subscription should cover all hospital charges to a patient. The total number of days of hospital care which a subscriber may claim in any one year is usually limited. The grade or type of hospital accommodation which a plan provides should of course conform to local custom and should be such as to satisfy the reasonable expectations of subscribers. All routine hospital services should be included as a minimum, and special or additional charges should be eliminated as far as practicable. Extra charges for diagnostic and "special" services discourage prospective subscribers, and fail to provide protection for the patient against important items of cost.

Exclusion of Certain Diseases

Benefits do not as a rule include hospital service of a kind not ordinarily rendered by community hospitals; thus acute veneral diseases, pulmonary tuberculosis, quarantinable diseases, and mental diseases are usually excluded; obstetrics may be included after a reasonable waiting period. The confusion and conflict which are apt to arise where responsibility is divided are avoided by excluding care already provided for under workmen's compensation laws.

Subscribers must be made to understand just what the hospital will and will not do under the agreement; in presenting the plan to the public, its limitations should be stated with proper emphasis.

FINANCES

In existing group hospitalization plans, from six to twelve dollars per year is the range of rates charged. The amount required will vary with the general cost levels of the locality, with the scope and character of services offered (these will be influenced by local custom), with the age and occupational character of the subscribers, and according to the requirements for promotion and administration.

A time limit on the length of stay of all patients in the hospital during any given illness is an actuarial requisite and is usually a three weeks' period.

It is possible that in case of widespread disaster the demands upon hospitals may exceed their utmost capacity after all efforts have been exhausted to meet the pressing situation, and it is usually provided that in such an event the hospital organization will reimburse the subscriber with a specified amount, say a sum equal to the annual subscription (in a few instances twice this amount). This is, of course, a contingency which will not ordinarily have to be met.

When risk or expense is reduced by the enrolment of a large number of subscribers in a single group, or when the group is of such age or occupational class as to lower the risk, a reduction in the annual subscription rate may be allowed.

When the adopted rate is found to yield a sum which is greater than is necessary to meet hospital costs and to provide a reasonable reserve, the surplus should be employed for the benefit of subscribers, either in the form of a reduction in rate or of an extension of hospital services.

When owing to unexpectedly high sickness rates the payments made by subscribers to the organization fail to cover hospital costs, subscription rates must be increased unless a reserve fund has already been built up out of which the deficit can be met. In the absence of a reserve fund and before the newer rates become effective, the participating hospitals may have to accept payments that do not fully cover their costs of maintenance; losses of this kind are however likely to be offset by the increased number of paying patients and the lower number of free patients which result from the plan.

If estimates based upon past experience indicate that the payments to be made by subscribers will be sufficient to enable the fund to reimburse participating hospitals at a given rate per day (whether this be $5, $5.50, $6, $6.50, or $7) a fraction of this amount (50 cents to $1 per day) may wisely be withheld for distribution in whole or in part at the end of the fiscal year, in order to insure an equitable administration of the fund in case the morbidity rate for the year should be unexpectedly high.

The basis on which hospitals are to be paid from the central fund should be alike for all, when similar services are offered to subscribers.

STAGES IN THE DEVELOPMENT OF A GROUP HOSPITALIZATION PLAN

There are three stages in the development of a plan. First, what may be called the technical stage, during which the hospitals themselves, with such legal and other advice as may be required, determine upon the services to be offered and the rates which they believe to be sound. Second, the promotional stage during which this plan has to be organized in working form and accepted by groups of persons who are ready to pay for the services offered. Third, the administrative stage when the plan is actually in operation and must be capably managed.

In a community with only one hospital, what is referred to above as the technical stage should be developed by the governing body of the hospital with the counsel of its medical staff.

In communities with more than one hospital of good standing the initial stage of the plan should be carried through by a representative group or organization of hospitals themselves, with the counsel of physicians of standing representing the hospital staffs and, if possible, the local medical societies. The permanent controlling organization, representing the hospitals, may enlist the aid of an advisory body including representatives of the medical profession and the public.

EFFECTIVE PRESENTATION TO THE PUBLIC

The problems of promotion and of enrolling groups of subscribers are not ordinarily familiar to hospital personnel and generally will require the participation of expert and experienced persons. In some instances it may be best to appoint a private agency, specializing in such work, to render service or to furnish persons who will render expert service, but payments to such an agency should not be allowed to diminish unduly the benefits received by subscribers.

CONTROL OF THE PLAN

The control of the plan as well as the direction of activities incidental to it must remain in the hands of a non-profit organization composed of or representing the hospitals, and must not be transferred to an employed enrolling agency. Hospitals should decline to enter into contracts with any business agency which controls or seeks to control the finances or management of the plan.

LEGAL ADVICE

During the first or technical stage, group hospitalization plans should be discussed with competent legal counsel in order to insure that they conform to the laws of the state and locality. Insurance commissioners in more than a dozen states have ruled that hospital service rendered to subscribers in an annual payment plan is not insurance.

In considering the above recommendations with a view to their application in the District of Columbia your committee feels that although they are in general commendable, they fall short of providing proper safeguards to the best interests of the hospitals, the medical profession and the public in the following particulars:

1. To prevent destructive competition and the consequent inevitable lowering of hospital standards, the participating hospitals, (which, as stated, should include all hospitals of standing in the community), should bind and pledge themselves jointly and severally, to refrain from participating in any other group hospitalization scheme.

2. To prevent destructive competition and the consequent inevitable lowering of the standards of the practice of medicine, both scientific and professional, the participating hospitals should to that end coöperate with the Medical Society of the District of Columbia by binding and pledging themselves, jointly and severally, to refrain from engaging in the corporate practice of medicine, including the so-called laboratory branches, in any form whatsoever.

It is the hope of your committee that the entire membership of the Society may so familiarize themselves with group hospitalization plans as to enable them to act intelligently on any plan that may later be submitted for their approval.

Committee:
Thomas A. Groover, *Chairman*
Joseph S. Wall
William H. Hough
Oscar B. Hunter
John D. Thomas
H. C. Macatee
H. H. Kerr

PROGRAM, SOCIETY ACTIVITIES

The Program Committee announces the following scientific program for April and May:

April 12: Program under the auspices of the Section on Ophthalmology and Laryngology, announced in the March number.

April 19:

1. "Tuberculosis of the Stomach: Case Report With Motion Picture of Operation." Drs. Frank L. Williman, Daniel L. Borden, and Oscar B. Hunter.
2. "Resuscitation of the Stopped Heart by Intracardial Therapy; Demonstration of the Artificial Pace-Maker." Dr. Albert S. Hyman, Director, Witkin Foundation for the Study and Prevention of Heart Disease; Cardiologist to the Beth David and Manhattan General Hospitals, New York City.

April 25 and 26: Annual Scientific Session. See announcements below.

May 3: Annual meeting with election of officers.

May 10:

1. "Anomalies of the Intestines. A New Operative Approach." Dr. W. Warren Sager.
2. "Medicine in the Orient." (Illustrated.) Dr. Edward E. Richardson.

May 17: Program under the auspices of the Section on Neoplastic Diseases.

ANNUAL SCIENTIFIC SESSION

The Medical Society of the District of Columbia

Tuesday and Wednesday, April 25 and 26, 1933

From the titles of papers, the caliber of the essayists, the many interesting and instructive exhibits, and particularly from the stress that has been given to the social events, the 1933 meeting would seem to give promise of eclipsing previous assemblies. The component State Societies of the American Medical Association within recent years have been holding postgraduate assemblies as well as annual meetings. It is believed that the meeting this year, to be held in Washington, will partake of both types of assemblies. By far a larger number of medical friends and affiliates from neighboring States and communities will be in attendance. The guest speakers this year will include Drs. Maude E. Abbott, Leonard G. Rowntree and Dean Lewis. Dr. Abbott is Curator of the Medical Museum of the McGill University. She was a student and close personal friend of Sir William Osler, having worked with him in his Montreal days. She is considered the greatest living authority on congenital heart disease and is the author of numerous publications on this subject. Dr. Rowntree is Director of the Philadelphia Institute for Medical Research and was formerly Chief of Medicine at the Mayo Clinic. He first came into prominence as the originator, together with Dr. Geraghty, of the phenolsulphonephthalein test of renal function. His researches in medicine have covered many fields. He has published hundreds of articles in scientific medical journals. Dr. Lewis, a near neighbor, is President-elect of the American Medical Association. He is Professor of Surgery at the Johns Hopkins University and Surgeon-in-Chief at the Johns Hopkins Hospital. Dr. Lewis is Editor, "Archives of Surgery," "International Surgical Digest," and "Practice of Surgery."

On the morning of the first day there will be 7 clinical presentations by the attending staff of Gallinger Municipal Hospital. Such subjects as "Monocytic Leukemia," "Heart Block," "Advances in Renal Function Testing," "Clinical and Roentgenographic Demonstration of Aneurism of the Aorta," and "The Diagnosis of Diseases of Liver" by Dr. Wallace M. Yater, will be presented. In the afternoon there will be 6 papers, including "Roentgenography of the Arteries of the Extremities," Dr. Rowntree's paper, "Recent Advances in Diseases of the Endocrine Glands," etc. On Wednesday morning 6 presentations in clinical surgery will be made, including such subjects as "Lipoidal in Gynecology," "Closure of the Abdomen in Perforated Appendicitis," by Dr. J. F. Mitchell, "Abnormal Motility of the Upper Urinary Tract," etc. In the afternoon session on Wednesday will be included such subjects as "Early Diagnosis of Cancer of the Rectum and Rectosigmoid," "Present Status of the Etiology of Rheumatic Fever," "Chronic Peptic Ulcer in Childhood," by Dr. Charles S. White, together with Dr. Maude E. Abbott's "Personal Reminiscences of Osler and Remarks on His Contribution to Our Knowledge of Heart Diaease."

There will be 23 scientific exhibits including "Experimental Cyanide Poisoning," by Dr. George B. Roth; "Crystallization of Insulin," "Bone Pathology as a Result of Endocrine Disturbances," "Tumors of the Heart and Pericardium," "Fresh Tissue Demonstration—Autopsy and Operative Specimens," "Banti's Disease," Drs. L. H. Taylor and Mary Holmes. The technical exhibit this year will be supported by 14 commercial firms. Instruments, new therapeutic appliances and drugs, will be demonstrated. Exhibits, both technical and scientific will be held each morning and afternoon, April 25 and 26, at 1718 M Street.

On the evening of Wednesday, April 26, will be the meeting to which the general public is invited; address by Dr. Dean Lewis, "Changing Times in Medicine."

On Tuesday, April 25, at 12:30 Noon, a complimentary luncheon is given all *registrants*, members and guests. On Tuesday evening at 7:30 P.M. at the *Shoreham Hotel*, a dinner for members and guests will be served. The entertainment will be given by talent selected from our membership. Drs. F. A. J. Geier, F. A. Hornaday, and Wm. Raymond Thomas have been doing excellent work in preparation for a real evening.

The program for visiting ladies under the auspices of the Woman's Auxiliary to the Medical Society of the District of Columbia will include a motor ride to places of interest around the City, visiting the Capitol, Library of Congress, Smithsonian Institute, Lincoln Memorial, Cathedral; banquet and entertainment at Shoreham Hotel; motor ride to Mt. Vernon, Arlington National Cemetery, Fort Myer; luncheon at Shoreham Hotel.

NOTE: Complete program for this assembly is available at the Medical Society Headquarters, 1718 M Street. Members of the medical profession living outside of Washington may be assured of a warm welcome should they come to Washington on April 25 and 26. All, both members and guests, register Tuesday A.M.

PUBLICATIONS BY THE STAFF OF ST. ELIZABETH'S HOSPITAL

Since the first of the year, five books have appeared by the staff of St. Elizabeth's Hospital. They are:

Crime and Criminals, by Dr. William A. White, Farrar & Rinehart, New York.

Forty Years of Psychiatry, by Dr. William A. White, Nervous and Mental Disease Publishing Co., Washington.

Neuropathology, by Dr. Walter Freeman, Saunders Co., Philadelphia.

Case Studies in the Psychopathology of Crime, by Dr. Ben Karpman, Mimeoform Press, Washington.

The Adolescent Boy, by Winifred Richmond, Ph.D., Farrar & Rinehart, New York.

PERFORATED DUODENAL ULCER

(Continued from page 91)

SUMMARY

The 15 cases of perforated duodenal ulcer that have been reviewed allow me not to assert, but to suggest, that the incidence of such accidents seems unduly high and that overindulgence in alcoholic beverages may be an etiological factor in their occurrence. Excision of the ulcer, followed by posterior gastrojejunostomy, has given good results.

ACTIVITIES OF SECTIONS

Program for the Section on Internal Medicine, Dr. Stuart O. Foster, Chairman, meeting to be held April 28, 1933, 8 P.M.:

1. "Treatment of Early Syphilis with Especial Reference to Salvarsan," Dr. Charles R. L. Halley. Discussion: Dr. H. H. Hazen.
2. "Rat Bite Fever and Relapsing Fever," Dr. Edward Francis, National Institute of Health.
3. Election of Officers.

THE GEORGE M. KOBER MEDICAL SOCIETY

The regular monthly meeting of the George M. Kober Medical Society was held at the Washington Golf and Country Club on Monday, April 17. Dr. William P. Argy reported "A Case of Senile Tetany Due to Hypoparathyroidism." Dr. Russell J. Fields discussed "Recent Development in Dermatology." The regular May meeting of the Society will be held on Monday evening, May 15. Program:

1. "Case Report: Pneumonia in the New Born," Dr. William F. Burdick.
2. "Modern Problems in the Care of Feet," Dr. Frank M. Hand.

Some recent notes concerning presentations by members of the George M. Kober Medical Society follow: Dr. Robert A. Bier read a paper before the Louis Mackall Medical Society on March 14, entitled "Malnutrition in Children;" also an address on "The Tuberculosis Problem in the School Child" before the teachers of the Public Schools of the District of Columbia on March 16. Dr. Ernest E. Hadley began a series of six lectures on the psychologic processes at work in the formation of dreams on Tuesday evening, April 11. These lectures are in connection with courses given by the Baltimore-Washington Psychoanalytic Society. An announcement reads: "In pursuance of the policies of the International Psychoanalytical Association, there will be offered under the auspices of the Training Committee, a variety of courses and seminars. Attendance upon some of these courses will be required of those who plan to apply for membership in the Society. Attendance upon others will be optional. Some of the courses will be open to physicians only at the discretion of the Training Committee. All applications and inquiries should be made to the Chairman of the Training Committee, Dr. William V. Silverberg, 1726 Eye Street, N. W., Washington, D. C."

CONTAGIOUS DISEASE REPORT, MARCH, 1933

Health Department, District of Columbia

	Morbidity	*Mortality*
Typhoid fever	2	1
Typhus fever	0	0
Smallpox	0	0
Measles	17	1
Scarlet fever	87	0
Whooping cough	16	0
Diphtheria	18	0
Influenza	7	7
Poliomyelitis	0	0
Encephalitis-Lethargica	0	1
Epidemic Cerebrospinal Meningitis	1	0
Tuberculosis (all forms)	92	59
Syphilis	454	9
Gonorrhea	193	1
Chickenpox	191	0
Chancroid	2	0
Pellagra	1	1
Pneumonia (all forms)	138	67

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II MAY, 1933 NUMBER 5

THE IRRADIATION TREATMENT OF HYPERTHYROIDISM*

GEORGE E. PFAHLER, M.D., SC.D.

Philadelphia, Penna.

The treatment of hyperthyroidism by irradiation is not new to you, for many of you have undoubtedly coöperated with Drs. Groover, Christie, and Merritt, who have done some of the best work in this field, and you have been able to observe the results at first hand. My observations can only be, therefore, a confirmation of their conclusions. Even with our combined cases, we must be overwhelmed by the large number of cases which have come under the observation of Dr. Pemberton whom we have the honor to hear tonight.

Hyperthyroidism, however, is not merely a surgical or radiological problem, but in my opinion its treatment demands the coöperation of the internist. The internist is usually the first to come in contact with a case of hyperthyroidism. To him belongs the responsibility of making the diagnosis and its differentiation from other similar clinical syndromes; and he should remain in charge until the patients are restored to a normal condition and until they are able to carry on their occupations. Treatment does not consist merely in treating the thyroid either by irradiation or operation, but the predisposing and exciting causes should be removed, and after active local treatment the patient should be guided and guarded by competent medical advice. Crile says, "In 3.3 per cent of our total cases, there is a recurrence of the hyperthyroidism after partial thyroidectomy. In every case in which this occurs it will be found that there has been a persistence of the agents which were active in producing the primary hyperthyroidism—focal infection, social maladjustments, worry, overwork, or some other strain." In general, about 10 to 20 per cent of cases of hyperthyroidism fail to get permanently well, whether treated by surgery or irradiation. It is, therefore, quite proper that the subject of non-operative treatment of hyperthyroidism should be presented before this body, for the general care of the patient is absolutely essential.

It is well known to you all that patients who are suffering from hyperthyroidism associated with a goiter postpone the consultation with their family physicians for fear that he or she will be sent to a surgeon for operation. To avoid such delays and to conserve the patient's energy it is, therefore, well to remember that irradiation therapy is approximately of equal value to surgery in the end-results, and if patients learn that not all cases must be operated upon they will be less likely to delay consultation.

In dealing with hyperthyroidism, we must assume that there is an overgrowth or a new growth of the thyroid gland, or a hyperfunction of the normal amount of glandular tissue. The condition can be relieved by surgery and satisfactory results can be obtained if the surgeon removes just the right amount of tissue; or the disease can be controlled by irradiation which gradually reduces the activity of the cells, even in cases with no tumor or hypertrophy, and causes an atrophy of the hypertrophic or hyperplastic tissue when present. By careful observation and basal metabolic rate studies one need not exceed the necessary dosage.

---

* Read before the Society, March 8, 1933.

Indications For Irradiation

Based upon personal observations and those of other radiologists, I believe that irradiation is indicated in all cases of hyperthyroidism in which the patient is not in crisis, or is not suffering from definite pressure symptoms. I recommend operation in all simple or non-toxic goiters, unless there is some contraindication, in which case a moderate amount of irradiation may be used. Sometimes brilliant results are obtained even with large goiters of this type.

Advantages Of Irradiation

1. The fear of operation is eliminated and therefore the patient is more likely to come under treatment early and before cardiac damage has taken place.
2. With the elimination of the necessity for operation, the patients are not interrupted in their occupation. When the disease is well advanced, or serious symptoms are present, they must, however, be put at rest.
3. There is no pain or shock and no great inconvenience if the condition is treated reasonably early.
4. Patients with advanced disease or serious heart complications may be treated without shock, and if radium is used need not even be removed from their rooms.
5. There is no risk of mortality from the treatment.
6. There is absence of scars or keloid formation.
7. The end-results are approximately equal to those obtained by surgery.

Objections To Irradiation Treatment

1. The danger of burns naturally comes into a patient's mind, because they occurred occasionally in the early years of irradiation therapy when the method was being developed, and since such patients do not die, a few such accidents in the country become known far and wide, whereas if a patient dies during an operation from any accident or any complication, burial takes place. It is accepted as one of the hazards of the procedure and may be ignored, or is soon forgotten.
2. Telangiectasis and skin atrophy are dangers which must be taken into consideration. In my series the former occurred in 3.0 per cent of 533 cases, but these were earlier treated cases. It depends upon the total amount of irradiation, and while it may follow a single excessive dose of rays, it may occur without any erythema ever having been produced. I have not seen telangiectasis in any cases in which I had not given more than 8 series such as is described in my technic. I aim, therefore, to obtain results with from 6 to 8 series. Even when present, with the exception of 1 case, it has only been slight, and has not bothered the patients much.
3. Exacerbation of symptoms may occur after the first treatment. This has been especially emphasized by Borak, Pordes, and Goette, but in my experience such an increase has been insignificant and no more than may occur from time to time independent of treatment. If such an increase is feared, it may be well to decrease the dose in the first series, especially in the severe cases.
4. Myxedema has not occurred in any of my cases. Hypothyroidism occurred in only 4 cases of the series, or less than 1 per cent, and in only 1 of these 4 cases was it sufficiently severe to require the use of desiccated thyroid. Groover reported subsequent hypothyroidism in only 1.3 per cent of his cases. My low percentage of hypothyroidism after irradiation is in part due to ability to reduce the excessive secretion gradually and in part to the fact that the normal thyroid cells are rather resistant to irradiation. Walters, Anson and Ivy state that the experimental literature at hand indicates that the normal thyroid tissue is resistant to X-rays and concluded from their own studies that "the normal thyroid of the dog is quite resistant to X-rays, and degenerative changes are not caused by the dosage used in the experiments, which is a dosage known to be of clinical value, and in the dosage used do not cause extensive proliferation of connective tissue." I also have clinical proof that the normal thyroid is very resistant to

irradiation, in the fact that I have not obtained hypothyroidism in any cases of carcinoma of the larynx, pharynx, or neck in which many times the total dosage used in hyperthyroidism was used. The diseased thyroid tissue, on the other hand, seems to be very sensitive to irradiation as judged by clinical results.

5. Regarding the possibility of damage to the parathyroids, Ivy and his associates state: "The experimental results indicate that the clinical dosage in the treatment of hyperthyroidism will not injure the parathyroids." Confirming this experimental work, I can state that none of my patients and none recorded in the literature have shown tetany following irradiation. Neither has any tetany occurred following the enormous dosage used in the treatment of carcinoma of the larynx, in which the thyroids and the parathyroids are constantly exposed to irradiation of sufficient quantity to cause the surface skin and the surface of the mucous membrane to desquamate.

6. Difficulty in subsequent surgical treatment, if this should be necessary, has been adduced as an objection to irradiation. This objection need only be considered in a small percentage of cases (only 6.8 per cent of my cases were operated upon) and in only 1 of these, an early case in the series, was any difficulty involved. It is now generally admitted that adhesions are found in as many cases which have not had previous irradiation as in cases which have been treated. Eiselberg, who was first to consider adhesions as a post-irradiation complication, now disregards them as irrelevant.

7. Slowness of response to irradiation has been objected to, but with irradiation one usually gets some improvement at the end of a month and very definite improvement at the end of two months. If the surgeon uses two weeks for preparing his patient for operation, two weeks for recovery from the operation and a month for convalescence, the difference in time is not so great. At the end of these two months, however, one may generally expect a more complete relief of symptoms from surgery than from irradiation, because the surgeon removes the excess of glandular tissue at once, while with irradiation one reduces the hyperactivity and the hypertrophy or hyperplasia gradually. This is a slow and progressive effect. This slow response is not without its advantages, however, since the activity of the gland can be checked by frequent metabolic determinations and the final result controlled with greater nicety than when the hyperfunctioning gland is removed at one sitting. During this period of early treatment the internist should use all his known methods of helping the patient.

8. The question of permanent cardiac impairment developing during the prolonged irradiation treatment must be considered since the improvement from irradiation comes more slowly than from surgery, but this difference is not as great as would at first appear. There is likely to be considerable delay and advancement of the disease and damage to the heart before the patient will consent tô an operation, which will make up for any delay in the results from irradiation. Progress in cardiac impairment may also occur in cases treated surgically, as is indicated by the report made by Willius, in which he states: "At the time of initial examination at the Mayo Clinic, auricular fibrillation was found in 7 per cent of patients with exophthalmic goiter, and in 9 per cent of patients with hyperfunctioning adenoma. These percentages are doubled while the patient is under observation, that is, during the preoperative, operative and postoperative periods. Auricular fibrillation may occur as a permanent, intermittent or paroxysmal disorder." Holzknecht, states, "that not one case is found in the literature, proving that the prolonged period of irradiation resulted in unnecessary damage to the heart."

9. The danger of the development of carcinoma in toxic adenomas has been advanced as a special argument in favor of operations in all toxic adenomas. No one can dispute that a considerable number of toxic adenomas have been found to contain malignant tissue when removed and examined microscopically. It is, therefore, especially remarkable that none of my cases of toxic adenoma has become malignant,

and none recorded in the literature has become malignant. It would seem, therefore, undoubtedly true that irradiation prevents the development or continued growth of carcinoma in those that must have been present in the toxic adenomas that were treated, based upon the general averages.

It is recognized by everyone that for some reason carcinoma of the thyroid is unusually sensitive to irradiation. For example, many years ago, the late Dr. John B. Deaver sent to me a woman from whom he had removed partially a carcinoma of the thyroid. In referring her to me, he told me definitely that he did not succeed in getting all of the carcinoma out. I treated her and there was never any recurrence or development of this thyroid carcinoma during 13 years. However, during the thirteenth year she developed lung symptoms, and we found extensive metastatic carcinoma scattered through the lungs. However, there was even then no evidence of any local carcinoma about the neck or over the areas which had been treated. This case proves not only that Dr. Deaver was correct in his observations that he had not removed all of the carcinoma, but it proves that we controlled the carcinoma completely within the areas to which our radiation was applied. Other cases in my experience and in those of other radiologists have also given convincing proof of the radio-sensitivity of carcinoma of the thyroid. Therefore, I believe that we need not let this fear influence us in the selection of treatment.

TABLE 1

*Results in Our Cases—with an Analysis of 698 Cases of Goiter**

Cases with hyperthyroidism treated with roentgen rays	440
Cases treated with radium	6
Non-toxic cases treated	59
Malignancies	28
Total cases treated	533
Simple or non-toxic goiters in which irradiation was advised against and which were not treated	165
Total	698
Percentage of toxic cases cured or markedly improved	87.9

* These statistics have been collected from our records by my associate, Dr. Jacob H. Vastine.

Under hyperthyroidism or thyrotoxicosis have been classed all exophthalmic goiter cases, all toxic adenomas, and those which had a high B.M.R. associated with the characteristic nervous symptoms even when goiter and exophthalmos were not present. Those cases have been classed as cured in which the B.M.R. (taken routinely since 1921) is between plus 10 per cent and minus 10 per cent; the pulse has returned to normal; the weight has increased, approximately to what it was before the onset of toxic symptoms; nervous and other clinical manifestations have subsided; and in which the goiter has either completely disappeared or is so involuted as to be entirely unobjectionable from a cosmetic standpoint.

The nomenclature frequently used by the internists and surgeons is "economic restitution" or "rehabilitation." In my series of cases it can be seen that an 87.9 per cent "economic restitution" or "rehabilitation" was obtained (Tables 1 and 2).

TABLE 2

Results Obtained in the Treatment of 440 Cases of Hyperthyroidism

	CURED	MARKEDLY IMPROVED	NOT IMPROVED
Percentage	57.3	30.6	12.1
Average number of treatments	6.1	5.7	3.7
Average time observed, years	6.5	2.8	
Total cured or markedly improved, per cent	87.9		

Recurrence

After patients were regarded as cured in my series there were only 2 post-irradiation recurrences, or less than 1 per cent. There were cases in which the metabolic rate was rapidly brought down to within normal limits and subsequent tests within several months showed it to have risen 5 or more per cent above normal. In such cases which had been insufficiently treated, one or two more series of treatments were necessary before stabilization of the metabolic rate permanently within normal limits was obtained. These were not regarded as recurrences, since the patients were really still under treatment.

HYPERTHYROIDISM WITHOUT PALPABLE GLANDULAR ENLARGEMENT

This is a class of cases in which irradiation is particularly indicated. There were 48 of these cases in my series. There was economic restitution in 37 cases. The treatment failed in 7 cases, and 4 patients could not be traced.

In 3 cases which were not responding satisfactorily, treatment over the cervical sympathetic ganglia and over the suprarenals was tried but without appreciable effects.

Hoarseness did not develop, because the larynx and arytenoids were protected. Four of my earlier cases developed a severe tracheitis, but these 4 had more than the 8 series, and it was doubtful whether the effects were due to the irradiation.

Evidence of injury to the parathyroid glands was not observed in any of the cases. It is likely that the normal parathyroids, like the normal thyroid, are not sensitive to irradiation. I believe, however, that a diseased parathyroid is radiosensitive, and a confirmatory clinical observation has been made recently upon this point by Merritt.

TECHNIC

I routinely employ roentgen rays, using 130 kilovolts, 5 milliamperes, at 25 to 30 centimeters distance, with the equivalent of 6 millimeters of aluminum filtration. The cervical region is divided into 4 fields, approximately 5 by 15 centimeters in size. Two of these are anterior and 2 are posterolateral. The lower border extends down over the thymic region. The larynx is protected with lead. The rays are directed medially and downward, so that a cross-firing effect is obtained in the thyroid region. These 4 areas constitute 1 series and they are usually given in 1 day. This series is repeated in 3 weeks, then in 4 weeks, the interval being increased according to the improvement obtained. In simple or colloid goiters, 30 or 40 per cent dosage may be given through the 4 above fields without danger of producing hypothyroidism. These several small doses will often be sufficient to show a definite decrease in size. In adenomata localized doses are usually employed, with cross-firing of the adenoma through 2 portals.

In the mildly toxic cases I give an initial 50 per cent skin erythema dose through each of 4 portals. This is repeated in 3 weeks and then the amount is decreased and the interval increased. In the severer cases it is better to begin with smaller doses, not exceeding 40 per cent at the first series. This may be increased in subsequent series. More than 6 series are rarely necessary, a good response sometimes being seen after 4 series. I am reluctant to give more than 6 or 8 series. If a patient is not definitely improved after 3 to 5 series and a lapse of 2 or 3 months from the beginning, other measures should be employed. A careful record of the patient's pulse, weight, and general health and the condition of the skin is made at each visit, and frequent metabolic determinations are made. Foci of infection are removed. Chest examinations are made routinely on each new patient. I recommend administration of quinine hydrobromide in 5 to 10 grain doses, 3 times a day, unless ringing of the ears occurs (Bram). Dodd's lotion is prescribed for application to the neck to avoid skin damage. The patient is cautioned against sunburning the neck or applying irritating salves or lotions. Rest, so far as practicable, is advised, the patient being told never to stand when he can sit and never to sit when he can lie down. A high caloric diet of easily digested food is recommended. The patient is advised against the use of stimulants. I have not found the administration of iodine helpful.

I employ roentgen irradiation routinely, because it has produced such uniformly good results. I have treated only a few cases with radium which were unsuitable for X-ray treatment. Loucks and Ginsburg prefer radium and have obtained excellent results. Just as good results can be obtained with radium as with X-rays. It would seem that radium is preferable for patients who cannot come for treatment, or for whom the excitement caused by the machinery would be harmful. I have successfully used radium needles interstitially in a localized adenoma which did not respond to roentgen therapy as fast as it should. This can be done under mild narcosis without shock to the patient, and it has proved to be a valuable procedure in selected cases.

Results Obtained By Other Radiologists

My results closely parallel those of other radiologists. In a previous presentation I reviewed the reports of 20 other radiologists, covering over 3,300 cases, of which an average of 85 to 90 per cent have been cured or markedly improved. There have been several excellent reports upon this subject since that time. That of Menville is probably the most comprehensive and the most representative, since he reviewed the work of 75 radiologists, both in Canada and the United States, by sending questionnaires. This covered 10,541 cases treated by irradiation, of which 66.2 per cent were cured, 21 per cent were markedly improved and 12.4 per cent were not improved. It is interesting to note that 10 per cent of these 10,541 were cases in which surgery had previously been tried without success. There were 8.45 per cent of recurrences following irradiation. These results, which are a fairly accurate cross section of the work done by radiologists generally, compare favorably with the cross section of the work done by the average surgeon as reported by MacLean in which he found the operative mortality rate alone to be 7 per cent in cases of exophthalmic goiter treated surgically, although the best clinics report less than 1 per cent. The records in the best organized surgical clinics, however, are as low as 0.5 to 1.5 per cent.

Summary and Conclusions

1. Irradiation with either roentgen ray or radium may be accepted as a useful method of treatment of hyperthyroidism, since the end-results are approximately equal to those obtained by surgery.
2. The fear of operation or delays preceding operation are likely to lead to cardiac impairment. This delay can be eliminated by the use of irradiation therapy.
3. Irradiation therapy does not involve shock or great inconvenience.
4. Associated medical care and general directions for conservation of energy are essential.
5. Irradiation is probably of value in the prevention of the development of carcinoma.

BIBLIOGRAPHY

Borak: Die Roentgentherapie und die Organotherapie bei innersekretorischen Erkrankungen. Strahlentherapie, 1925, **20**, 263.

Crile, G.: The Treatment of Certain Types of Hyperthyroidism. Tr. Am. A. Study of Goiter, 1932, p. 1. (Pub. by Western J. of Surg., Portland, Oregon.)

Ginsburg, S.: The Value and Place of Radium in Treatment of Diseases of the Thyroid Gland. Am. J. Roentgenol., 1930, **24**, 283.

Goette, K.: Ueber Schädigung nach Bestrahlung von Morbus Basedowii. Fortschr. a. d. Geb. d. Röntgenstrahlen, 1929, **39**, 111.

Groover, T. A., Christie, A. C., Merritt, E. A., et al.: Roentgen Irradiation in the Treatment of Hyperthyroidism. A Statistical Evaluation Based on 305 Cases. J. A. M. A., 1929, **92**, 1730.

Holzknecht, G.: Ueber die Röntgentherapie der Basedowschen Krankheit. Strahlentherapie, 1928, **30**, 605.

Loucks, R. E.: Clinical Evidence of Thyrotoxic Control After Radium Treatment. Am. J. Roentgenol., 1927, **18**, 509.

MacLean, N. J.: Observations on the Treatment of Goiter. Illinois M. J., 1925, **47**, 354.

Menville, L. J.: The Radiologic Aspect of Thyrotoxicosis. Radiology, 1932, **18**, 568.

Pordes, F.: Die oligosymptomatischen Thyreotoxikosen und deren Röntgenbehandlung. Strahlentherapie, 1928, **30**, 619.

Walters, O. M., Anson, B. J., and Ivy, A. C.: The Effect of X-rays on the Thyroid and Parathyroid Glands. Radiology, 1931, **16**, 52.

Willius, F. A.: The Heart in Thyroid Disease. Ann. Clin. Med., 1922-3, **1**, 269.

THE ETIOLOGY OF PERNICIOUS ANEMIA: A REVIEW*

Worth B. Daniels, M.D.

Clinical Professor of Medicine, Georgetown University School of Medicine

In 1822, 33 years prior to the publication of Addison's classical paper, a Scotch physician named Combe wrote in *The Transactions of the Medical and Chirurgical Society of Edinburgh* of this interesting disease. He called his paper "History of a Case of Anaemia." The patient described suffered from severe anemia, gastrointestinal symptoms and edema of the ankles, but in spite of all available forms of therapy slowly grew worse and died. A postmortem examination revealed nothing abnormal aside from pallor of the organs, and extensive observations prior to death by many medical men had revealed no cause for the anemia. Combe placed himself on record that in his opinion this form of anemia was a definite clinical entity. He said: "If any train of symptoms may be allowed to constitute anemia a generic disease, the following may be considered an example of it in its most iodiopathic form." He gave no opinion as to etiology but said that a Dr. Young "considers it a species of dyspepsia, for it is probably owing to some disorder of the digestive and assimilative organs, that its symptoms have their origin, and to the correction of this derangement, we must look for a removal of the disease." Thus Combe and his confrere, Dr. Young, in 1822, empirically and without scientific justification laid down an hypothesis which after years of random speculation seems at last to be coming into its own.

---

* Read before the Society, February 8, 1933.

Combe's paper did not seem to create any great interest among the physicians of his day, for in 1855 when Addison published his paper entitled, "On the Constitutional and Local Effects of Disease of the Suprarenal Capsules," he believed that he was describing an unrecorded clinical entity. In a previous article published in 1849 in the London Medical Gazette, Addison seems to have confused pernicious anemia with destructive disease of the adrenals. He found at necropsy in some individuals with progressive anemia and weakness abnormalities of the suprarenal capsules. He inquired: "Is this merely incidental or is this the cause of the symptoms found?" In answer he said: "Making every allowance for bias and prejudice inseparable from the hope or vanity of an original discovery, I confess, that I feel it very difficult to be persuaded it is not true." He thought that "these hitherto mysterious bodies, the suprarenal capsules, may be directly or indirectly concerned with sanguinification; and that a diseased condition of them, functional or structural, may interfere with the proper elaboration of the body generally, or of the red particles more especially."

The first portion of Addison's paper on suprarenal disease is devoted to the description of a group of patients with iodiopathic anemia and would today stand as an excellent description of so-called Addisonian pernicious anemia. At autopsy he could find no changes aside from fatty degeneration of the heart, the semilunar gangia and the solar plexus. Associated with these evidences of abnormal fat metabolism was always a state of well maintained subcutaneous fat and general nutrition which suggested that morbid fat changes might be essentially concerned. Although Addison was unable to give any adequate explanation of the cause of anemia in the cases he described, he did leave an accurate clinical definition of the disease which prevented to some extent the general confusion which existed on the continent. Even Biermer's classification permitted the use of the term pernicious anemia to be used for other marked anemias of unknown etiology. The English, following in the footsteps of Addison, insisted that the term pernicious be limited to iodiopathic anemia as described by Addison and ruled out all cases where any ascertainable cause existed.

During the last quarter of the nineteenth century the knowledge of pernicious anemia was greatly augmented and the best scientific minds began to conjecture as to its etiology. Fenwick,, in 1877, showed by postmortem examinations that atrophy, fibrosis and degeneration frequently occurred in the gastric mucosa of subjects dying of this disease. He felt that this finding was closely related to the cause of this iodiopathic anemia. On the Continent, Cohnheim called attention to the bone-marrow changes found postmortem as did Osler and Pepper in this country. Conheim felt that these changes were indicative of a reversion in the blood-forming organs to the embryonic state and, therefore, significant to the etiology.

Ehrlich, in 1892, by discovering the use of the aniline dyes as blood stains opened a new field for the study of pernicious anemia. He found the megaloblast characteristic of this type of anemia and considered the disease to be due to a degeneration of the bone marrow, so-called "megaloblastic degeneration." The other findings of this entity were considered secondary to the bone-marrow change. It is obvious that the German viewpoint was largely based on hematology and considered the disease due to abnormal blood formation. In contrast to this is the English view of that day based on clinical, hematological and physiological concepts. The disease was primarily an abnormal blood destruction productive of oligocythemia, and the bone-marrow changes were due to regenerative processes initiated by the profound physiological need for new blood elements. This contention was strongly supported by Hunter who first showed that the liver of patients with pernicious anemia contained a considerably higher percentage of iron than the normal and a higher percentage than the liver of patients with other anemias. On this basis he constructed his theory that the anemia was due to the toxin of some specific organism in the bowel. This toxin on absorption into the portal circulation produced there a rapid and profound destruction of red corpuscles. The pigment freed from these corpuscles was then deposited in the liver lobules. To round out this theory it was assumed that the bone marrow then underwent hyperplasia in an attempt to replace the destroyed corpuscles. Other observers felt that both abnormal formation and destruction occurred, the latter taking place because the circulation was presented with immature and inadequately formed red cells.

By 1890 it had become evident that glossitis, atrophy of the gastric mucosa, gastro-intestinal symptoms, neurological abnormalities and a disturbance of pigment metabolism were generally associated with this anemia, so that it could no longer be viewed as entirely a disease of the blood. It must henceforth be considered one involving 3 essential functions, namely the gastrointestinal, the hematological and the neurological.

Between 1890 and 1897, Von Noorden, Einhorn and others, developed the modern methods of chemical examination of the gastric juices and thereby opened to 'clinical medicine' another broad vista into pathological physiology. This work was particularly important in paving the way to a better understanding of pernicious anemia and in helping to weed out the scores of instances of anemia, not Addisonian in type, which crept into its literature. Martius, in 1897, reported chemical gastric analyses in 17 individuals with achylia gastrica. Two of these patients died of pernicious anemia and showed at necropsy mucosal atrophy of the stomach and intestines. He felt that though some degree of anemia could be caused by deficient gastric secretion, the primary disturbance was one of impaired food absorption as the result of intestinal mucosal atrophy. It has since been ascertained that the appearance of mucosal atrophy in the intestine noted by Martius is apparent rather than real and is the result of abnormal postmortem distension of the bowel with gas. As gastric analysis came into routine use, the literature was flooded with reports of achlorhydria and achylia gastrica in pernicious anemia. It soon became evident that achlorhydria was an invariable finding in this type of anemia. Cornell states in his splendid and comprehensive review of this disease: "If one fact has received ample confirmation in connection with the entire subject of pernicious anemia it is this,—the stomach contents do not contain free hydrochloric acid." The lack of acid has been shown by numerous investigators to precede the onset of anemia by long periods, in one reported instance by as much as 25 years, and no case of pernicious anemia is on record in which at any previous examination there was free hydrochloric acid.

Achlorhydria may be constitutional and hereditary or it may be acquired. The acquired form may be due to alcoholism, gastro-enterostomy, gastrectomy, gastric cancer and so-called toxic or infective agents, or it may be a concomitant of many debilitating diseases. Absence of free acid in the stomach has been shown to exist in a considerable percentage of non-anemic relatives of patients with pernicious anemia. Indeed, in 2 children aged 4 and 6 years, sons of a patient with pernicious anemia, no free acid was found. The absence of free acid in this disease is a permanent defect not influenced by histamine, remissions or liver therapy.* This is a strong indication of its basic relationship to the disease but also indicates that it is a factor in etiology rather than the entire cause. This is further substantiated by the fact that often there is absence of enzymes and free hydrochloric acid from the gastric contents for long years prior to the onset of illness or anemia. These data suggest that another influence or influences must come into play to give rise to the anemia. Finney and Rienhoff report 2 instances of the onset of pernicious anemia out of 9 patients who had had complete gastrectomy. Here, too, one must be on guard, since undoubtedly these were done for gastric cancer. In that disease an anemia occurs and bone-marrow metastases might give rise to a blood picture very like that seen in Addisonian anemia.

Castle, however, in a case of gastric cancer with achlorhydria and a hyperchromic, macrocytic anemia of the pernicious type, has obtained a typical reticulocyte response with liver therapy. This, indeed, suggests that the achylia was the basis of the anemia.

The finding of an invariable achlorhydria in patients suffering from this disease has made it the starting point for many etiological hypotheses. Hutchison, in 1909, felt that the achylia could not be the entire cause but suggested that its presence robbed the stomach of its normal antiseptic and in this way predisposed to pernicious anemia. Because of the similarity of the blood picture and frequent absence of free acid in sprue, gastric cancer, Bothriocephalus latus infections and pernicious anemia, Cornell believes that some single fundamental function may be responsible for the anemia in all of them. He sums up the question of achlorhydria and pernicious anemia in the following cautious way: "Achlorhydria, a functional abnormality of constitutional origin, is almost invariably associated with pernicious anemia and forms in these cases, a necessary link in an etiological chain, to which by addition of further unknown links, pernicious anemia is made to appear."

Aside from the familial occurrence of achylia gastrica there are on record in the literature an increasing number of studies indicating a hereditary influence in this disease. In the first place it never occurs in the full blooded negro who, in this country at least, frequently lives under exactly the same environmental conditions as to diet, hygiene, etc., as the white inhabitants. According to Minot, Palmer Howard was the first observer to note the familial nature of pernicious anemia. Since his time many reports have been made relative to this factor. Schauman, in 1918, had collected 24 families in which there was a distinct familial incidence. Klein is said to have found the disease in 3 brothers and sisters. Barker, in considering the hereditary nature of the entity, considers that it is a genotypic disease requiring a releasing factor in the environment to institute its actual development. Piney thinks that the blood changes are due to an embryonic reversion as the result of an hereditary tendency and that it is probably related to constitutional and hereditary achlorhydria. He would explain the nerve degenerations in the disease on the basis of abiotrophy. His theory then is almost identical with that laid down by Cohnheim many years ago.

Draper in his highly interesting and speculative volume on "Human Constitution," has arrived at a definite physical type most commonly found in pernicious anemia. From anthropomorphic measurements and observation the patient with this disease has a short, broad, turtle-like face with a prominent mandibular angle, short nose, long thin ears, broad, flaring costal angle, a highly placed umbilicus and general eunuchoid habitus. The hair is usually fine and almost invariably gray. Inquiring into the history of these patients it is found that graying of the hair is often premature.

---

* Connery and Jolliffe reported, in 1931, one instance of return of free acid after liver therapy in an otherwise undoubted case of pernicious anemia. All other reports give entirely negative results in this respect.

The factor of diet in etiology was long considered an important one and diets of all types were tried with only very limited success. An avitaminosis was thought at one time to be significant, but no concrete evidence was brought forward to bear out this contention. There is an unfavorable nitrogen balance present during the periods of activity of the disease and some observers have noted a decided temporary general improvement when high-calorie diets, especially those high in protein, were employed. This had little or no effect on the blood picture, however. Diets high in iron were used with indifferent results. Whipple blazed the trail for Minot and Murphy's splendid studies on diet. These led to the really epoch-making observation that diets high in such nucleoproteins as liver and kidneys cause a remission in the disease.

Among the various theories elaborated in the past to explain the etiology of this mysterious ailment those relating to infection and toxin formation, especially intestinal, are most prominent. Bacillus coli, Bacillus Welchii, streptococci and Monilia psilosis infections of the gastro-intestinal tract causing the elaboration of toxins have been studied and strongly supported by a number of investigators. There has been some experimental support for all these theories. For instance, an autolysate of hemolytic colon bacilli when injected into rabbits will produce an anemia with anisocytosis and macrocytosis. Hurst found that the duodenal contents of 100 per cent of the patients examined who were suffering from pernicious anemia or achlorhydria contained a long chain streptococcus, whereas only 11 per cent of individuals who were normal or the subjects of other diseases showed this flora. This made him suspect that this organism which he also found in the tongue lesions did play some part in the etiology of the disease. Wood, in his studies on sprue and its relation to pernicious anemia, found Monilia psilosis in 15 patients and was unable to find it in 40 patients who suffered neither from sprue nor pernicious anemia. By feeding monilia to guinea pigs he was able to produce siderosis, macrocytosis, and an extensive normoblast and bone-marrow increase. Cornell, following in the footsteps of Herter, found an increase of B. Welchii and its spores in the intestinal contents of pernicious anemia sufferers. He found that chronic infections produced in animals with this organism caused an anemia with anisocytosis and that the exotoxin would cause anisocytosis in vitro. He feels that the presence of all these organisms in excess of normal in Addisonian anemia patients is probably the result of an increased alkaline reaction in the intestine as a result of achlorhydria. Cornell warns that many chemical agents such as ricin, saponin, acetanalid, pyrodin and nitrobenzol may produce a macrocytic blood picture with some bone-marrow hypertrophy. But he wisely says that no specific agent can be seriously considered until it can be made to produce anemia, glossitis, achlorhydria and combined system-degeneration.

Before approaching the new and significant knowledge of the etiology of pernicious anemia it would be well to read what Cornell, who has reviewed the subject more completely than anyone else, was able to say about it in 1927. I quote his conclusion: "Pernicious anemia appears to be a superstructure of blood symptoms and nervous changes, superimposed upon an unknown but characteristically fluctuant foundation. Of this foundation we know nothing, but conceive of achlorhydria as its constant and only obvious expression. It is not impossible that several different factors may bring the unknown fluctuant process into operation. It is further possible that this process depends chiefly upon idiosyncratic characters of the patient. The wide-spread tissue involvement found, and the peculiar mass of biochemical changes suggest that this fundamental process is a disturbance of metabolism."

The original observations of Minot and Murphy on the value of the ingestion of liver or a potent extract of liver has been amply confirmed. Pernicious anemia patients under this form of therapy develop rapidly an out-pouring of new, young, red blood corpuscles and a gradual return of the hemoglobin and red blood cells to a normal figure. This improvement is maintained if the ingestion of liver is continued. In spite of the astounding relief of these clinical manifestations of the disease the ability of the stomach to secrete hydrochloric acid and pepsin is in no way improved. This fact, reinforced by a careful restudy of the development of pernicious anemia in patients who had, by some pathological or mechanical process, been deprived of a properly secreting gastric mucosa, inspired Castle to develop the theory that Addisonian anemia is a deficiency disease. He has been able to collect from the literature a number of what seem to be authentic instances of the development of this type of anemia in individuals with gastric cancer, gastrectomy and one instance in a girl of 13 years due to pyloric obstruction from matted tuberculous glands. In some of these patients liver therapy was used with typical reticulocyte response and a return of the blood to normal. This strongly indicates that these anemias are of the Addisonian type. The observation that achlorhydria exists following and during continued remission from liver ingestion completely demolishes all of the previous theories that the lack of acid allows the growth of a flora in the intestines capable of producing a toxic anemia. Castle also brings out the point that supplying liver in pernicious anemia is like supplying the necessary food factor in such deficiency diseases as scurvy or beri-beri. The quantitative character of the response to feeding of liver both in respect to the time of appearance of improvement of the blood and in its magnitude also suggest the possibility of a dietary deficiency disease.

There are then two vital facts regarding pernicious anemia: 1. Its response to liver is like that of a deficiency disease; 2. Achylia gastrica may play a part in its pathogenesis. Using this knowledge as a starting point, Castle makes the hypothesis that a virtual dietary deficiency might be produced by the absence of functional gastric juice even in the presence of an adequate diet. He then proceeds by a series of brilliantly conceived experiments, published during the past two years, to attempt to prove the hypothesis that inadequate gastric digestion of protein permits the dietary deficiency.

To patients with pernicious anemia he fed 200 to 300 grams of raw beef daily for 10 days without reticulocyte response or favorable effect on blood formation. He then had normal individuals ingest 300 grams of chopped raw beef and at the end of one hour's digestion regurgitate this material. This stomach content was incubated for 30 hours after being strongly acidified with hydrochloric acid and then introduced into the stomach of pernicious anemia patients by means of a Rehfuss tube. This method of therapy was used daily for 10 days on 10 previously untreated patients suffering from typical Addisonian anemia. In 8 patients there was a definite increase in immature erythrocytes followed by progressive improvement in the anemia. The response was in every way similar to that observed in patients taking moderate amounts of liver daily. Castle concludes from these experiments that in contrast to the conditions in the stomach of the pernicious anemia patient, there is found within the normal stomach during the digestion of beef muscle some substance capable of promptly and markedly relieving the anemia of these patients. Further experiments conducted along the same lines proved that normal gastric juice alone, normal gastric juice incubated with hydrochloric acid, and normal gastric juice incubated with an indifferent protein (not beef muscle) would not produce a hematopoietic response. When gastric juice was given in the evening and beef muscle the following morning to 4 patients with pernicious anemia, 2 patients showed no response, 1 patient showed only slight response and 1 showed a distinct effect. Gastric juice from normal individuals secreted after histamine injection and incubated with beef muscle produced typical reticulocyte response when administered to Addisonian anemia patients.

Searching further into the validity of his hypothesis, Castle shows that beef muscle when incubated with human saliva or duodenal contents as free as possible from gastric juice is inert, whereas beef muscle and duodenal contents known to contain gastric juice produce the typical response previously described. Beef muscle incubated with commercial pepsin and hydrochloric acid is incapable of stimulating the marrow. It was found that the mucosa of pigs' stomach ground up with beef muscle will exert the specific beneficial effect on blood production.

From the experiments described, Castle has decided that this substance capable of curative action in Addisonian anemia is made by the interaction of two factors. The beef muscle factor is referred to as the extrinsic factor and the gastric juice component as the intrinsic factor. The latter has been shown to be destroyed by heating to 70°C. to 80°C. It is not pepsin or rennin, but he believes it to be an enzyme. It is capable of interacting with the extrinsic factor (beef muscle) in neutral solution resulting in the production of a material having marked hematopoietic effect.

Castle, Heath and Straus in December, 1931, were able to show further, by a series of experiments conducted according to the methods previously used, that the gastric contents of patients with achylia gastrica who were not sufferers from pernicious anemia contained the intrinsic factor. Three of the individuals were patients with hypochromic anemia, and 1 had no abnormality aside from achylia. Their gastric contents were in no way different as to acid and enzymes from that of patients with typical Addisonian anemia except for the absence of the intrinsic factor in the latter. Patients with pernicious anemia, during a period of complete liver induced remission, were shown to lack the intrinsic factor except in 1 case. This patient had typical pernicious anemia except for apparently normal gastric juice. During relapse he was shown to lack the intrinsic factor but upon treatment the intrinsic factor was found during remission.

Following Castle's series of splendid contributions to our knowledge of the etiology of this anemia the general concensus of opinion was that it was a deficiency disease. It was thought to be due to the absence of a gastric enzyme capable of interacting with some protein or protein-like material to produce a substance normally exerting a stimulating influence over the erythroblastic tissues of the bone-marrow. Recently (March, 1932) it occurred to Morris that the unknown factor which Castle had demonstrated to be absent in the gastric juice of patients with pernicious anemia might be effective by intramuscular or intravenous administration. By animal experiments it was ascertained that gastric juice after neutralization could be injected intramuscularly without undue reaction. It was found that 10 to 20 cc. quantities of gastric juice administrated in this way gave an almost negligible reticulocyte response in pernicious anemia patients. Concentration of the juices by slow evaporation in an incubator produced a material capable of a more active result, producing reticulocytosis somewhat inferior to that obtained with intramuscularly injected liver. The slow evaporation evidently made the material somewhat inert, since Castle has shown that exposure for 3 days at 40°C. renders gastric juice inert when added to beef. By vacuum distillation, Morris has been able to concentrate large quantities of gastric juice in from 2 to 4 hours at a temperature not exceeding 40°F. The concentrate so obtained when injected intramuscularly has produced powerful hematopoietic response and remission quite as dramatic as that produced by liver injection. A reticulocyte rise from 0.5 to 5 per cent occurred in 10 hours. In a personal communication from Morris he states that since his paper was published, remission which persisted for 3 months following a single injection of gastric juice has been obtained in 2 patients. In these patients there was a more intense stimulation of the bone-marrow than has ever before been recorded in the literature. Morris and his co-workers feel that in some respects the active principal of normal gastric juice resembles insulin and some pituitary preparations; namely that they are all inert by mouth and potent when given by injection.

They think it not unlikely that the active material may be an internal secretion of the stomach. They speak of this principle as the hematopoietic hormone and propose for it the name Addisin in honor of Thomas Addison. One wonders whether the effect of gastric juice injected into the patient's muscle may not produce the same interaction which Castle has shown in vivo and in vitro between gastric juice and beef muscle. In a recent letter from Morris written me in answer to the above inquiry he states that he had considered this possibility but believes that no such reaction takes place. In a forthcoming article in the American Journal of Medical Sciences he will publish additional chemical proof that the active substance is not an enzyme and that since that article was submitted further substantiating data has been obtained. He ends his letter by saying: "We feel confident that Addisin is a hormone, and the lack of it in the stomach secretions is the probable cause of pernicious anemia."

Morris goes even further. In a short article entitled, "Polycythaemia Vera: A Theory Regarding Etiology" published in the Journal of Medicine of Cincinnati in August of this year he puts forward a fascinating theory. His idea is that the antithetic diseases, pernicious anemia and polycythemia vera, are instances of "hypo-" and "hyperaddinism" just as myxedema and Grave's disease are instances of insufficient and excessive thyroid secretion. These ideas of Morris are provocative of much thought, but final decision must be withheld until his work can be studied directly from more formal reports.

In summarizing our present knowledge of the etiology of pernicious anemia one is justified in saying that it is a disease producing a disturbance of function referrable to the hematological and neurological systems and that the primary defect which allows the production of these changes is in the secretion of the stomach. This defect may be either hereditary and constitutional or acquired. It consists in the inability of the stomach to secrete a substance, either an enzyme or a hormone, which normally produces a stimulus to the development and maturation of the red blood corpuscles. The neurological changes are as yet not satisfactorily explained, but probably in some way they primarily depend upon the absence or insufficiency of this substance.

BIBLIOGRAPHY

Addison, T.: On the Constitutional and Local Effects of Disease of the Suprarenal Capsules. London, S. Highley, 1855.

Addison, T.: Anaemia—Disease of the Suprarenal Capsules. Lond. M. Gaz., 1849, **43**, 517.

Barker, L. F.: The Etiology and Treatment of Pernicious Anemia. J. A. M. A., 1926, **87**, 80.

Biermer: Korrespondenzblatt f. Schweiz Aertze, 1872, **2**, 15.

Castle, W. B.: Observations on the Etiologic Relationship of Achylia Gastrica to Pernicious Anemia. Am. J. M. Sc., 1929, **178**, 748; ibid. 1930, **180**, 305; 1931, **182**, 741.

Cohnheim, I.: Erkrankung des Knochenmarkes bei pernicioser Anamie. Virch. Archiv., 1876, **68**, 291.

Combe, J. S.: History of a Case of Anemia. Tr. Med.-Chir. Soc. Edinb., 1824, **1**, 194.

Connery, J. E., and Jolliffe, N.: Studies on the "Acid Defecit" in Pernicious Anemia, With Report of a Case Showing Return of Free Acid. Am. J. M. Sc., 1931, **181**, 830.

Cornell, B. S.: The Etiology of Pernicious Anemia. Medicine, 1927, **6**, 375.

Draper, G.: Human Constitution. Philadelphia, W. B. Saunders Company, 1924.

Ehrlich, P.: Ueber Schwere Anamische Zustande. Verhandl. d. Kong. f. innere. Med., 1892.

Einhorn, M.: On Achylia Gastrica. Med. Rec., N. Y., 1892, **41**, 650.

Fenwick, S.: Lecture on Atrophy of the Stomach. Lancet, 1877, **2**, 77.

Finney, J. M. T., and Rienhoff, W. F. Jr.: Gastrectomy. Arch. Surg., 1929, **18**, 140.

Herter, C. A.: On Bacterial Processes in the Intestinal Tract in Some Cases of Advanced Anemia with Especial Reference to Infection with B. Aerogenes Capsulatus (C. Welchii). J. Biol. Chem., 1906, **2**, 1.

Hunter, W.: Pernicious Anemia. London, Charles Griffin, 1900.

Hurst, A. F.: Achlorhydria: Its Relation to Pernicious Anemia and Other Diseases. Lancet, 1923, **1**, 111.

Hutchinson, R.: A Clinical Lecture on Achylia. Clin. J. Lond., 1909, **33**, 193.

Klein, A.: Zur Aetiologie der secundären perniciösen Anamie. Wien. klin. Wchnschr., 1891, **4**, 721.

Martius, F.: Achylia Gastrica ihre Ursachen and Folgen. Leipzig, 1897.

Minot, G. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet. J. A. M. A., 1926, **87**, 470.

Morris, R. S., and Schiff, L.: Reticulocyte Response in Pernicious Anemia Following Intramuscular Injection of Gastric Juice. J. Med., 1932, **13**, 27.

MORRIS, R. S., ET AL.: A Specific Hematopoietic Hormone in Normal Gastric Juice; Preliminary Note. J. A. M. A., 1932, **98**, 1,080.

MORRIS, R. S., ET AL.: Erythyremia (Polycythemia Vera). A Theory Regarding Etiology. J. Med., 1932, **13**, 318.

OSLER, W.: Ueber die Beschaffenheit des Blutes und Knochenmarkes in der Progressiven Perniciosen Anamie. Centralbl. f. d. med. Wissensch., Berl., 1877, **15**, 498.

PEPPER, W.: Progressive Pernicious Anemia, or Anematosis. Am. J. M. Sc., 1875, **140**, 313.

PINEY, A.: Pernicious Anemia: Some Morphological and Etiological Considerations. Brit. M. J., 1924, **1**, 271.

SCHAUMAN, O.: Zur Kenntniss der sogenannten Bothriocephalus-Anämie. Helsingfors, Weilin & Goos, 1894.

VON NOORDEN, C.: Untersuchungen über schwere Anämien. Charité-Ann. Berl., 1891, **16**, 217.

WHIPPLE, G. H.: Pigment Metabolism and Regeneration of Hemoglobin in the Body. Arch. Int. Med., 1922, **29**, 711.

WOOD, E. J.: Pernicious Anemia in its Relationship to Sprue. Am. J. M. Sc., 1925, **169**, 28.

DISCUSSION

Dr. Wallace M. Yater: Dr. Daniels has given a most excellent review of this subject. He has recounted in an interesting way how pernicious anemia has been shown to be a deficiency disease due to the lack of some substance, probably a hormone, secreted by the gastric mucosa. Castle thought that an interaction between this unknown factor and the protein of the food was necessary before the final product was elaborated which regulated the activity of the bone marrow. The work of Roger Morris and his co-workers has thrown some doubt on this assumption, since this group has shown that the intramuscular injection of gastric juice alone will cause a prolonged remission of the disease. I want to speak briefly of three other diseases associated with anemia which may be due to a deficiency of some kind, possibly a similar deficiency as that in pernicious anemia. The one most closely related to pernicious anemia is "Bothriocephalus anemia." This is an anemia which is indistinguishable from Addisonian anemia, hematologically and pathologically. Birkeland (*Medicine, 1932, vol. XI, pages 1 to 139*) has thoroughly reviewed this subject and brings out the following points. The great majority of persons who harbor the fish tapeworm, *Diphyllobothrium latum*, in their intestines suffer no ill effects from this parasitism. About 750,000 persons in Finland are estimated to be infested with the parasite, but definite anemia develops in only one of 5,000 to 10,000 carriers. A dramatic change follows the expulsion of the worm, resulting in a permanent cure in many cases. Some patients have been observed, however, who have at one time recovered from an attack of tapeworm anemia, only to succumb at a later date to cryptogenetic pernicious anemia in the absence of the parasite. Achlorhydria is present in about 84 per cent of cases of "Bothriocephalus anemia." The use of liver produces results as in cryptogenetic pernicious anemia even when the tapeworm is not removed. Birkeland considers the rôle of the parasite to be only that of a precipitating factor, a trigger mechanism. Other parasites are similarly capable of ushering in pernicious anemia. Those individuals who develop the anemia might go through life without this complication were it not for the disturbance of biologic equilibrium due to some action by the parasite. "In accordance with this view it seems appropriate to classify surviving patients with Diphyllobothrium anemia as suffering from abortive forms of genuine pernicious anemia." Another disease which is now beginning to receive attention is idiopathic hypochromic anemia. This disease resembles pernicious anemia in almost every way except that it is a microcytic instead of a macrocytic anemia and the color index is low. Achlorhydria or hypochlorhydria is present. The anemia and all of the symptoms respond promptly to large doses of inorganic iron, but there is a tendency to relapse when iron is discontinued. The anemia is, therefore, "probably dependent upon an inadequate gastric digestion of organic iron which may lead to faulty hemoglobin synthesis and improper maturation of erythroblasts and normoblasts in the bone marrow" (*Dameshek: Am. Jour. Med. Sci., 1931, vol. 182, pages 520 to 554*). In this connection Mettier and Minot (*Am. Jour. Med. Sci., 1931, vol. 181, pages 25 to 36*) have shown that iron is more potent for blood formation when absorbed from an acid than an alkaline medium in the intestinal tract. The third disease I wish to speak of is tropical sprue. This disease is characterized by a distinctive sore tongue and mouth, a peculiar type of diarrhea, marked anemia, loss of weight and a tendency to remissions and exacerbations. Its etiology is unknown. Although the blood picture is often similar to that in pernicious anemia, free hydrochloric acid is often found in the stomach, but liver extract works just as well in sprue as in pernicious anemia. Undoubtedly a deficiency exists which is supplied by the liver extract. While the fundamental faults in these 3 diseases, as in pernicious anemia, are still unknown, it is encouraging to know that able investigators are constantly laboring on these problems.

HEART DISEASE IN WASHINGTON, D. C.

A STUDY OF ETIOLOGIC TYPES AND THE FACTORS OF RACE, AGE AND SEX IN 1,200 CASES[*]

LESLIE T. GAGER, M.D.

Professor of Medicine, Howard University School of Medicine

AND

W. LEROY DUNN, M.D.

Clinical Instructor in Medicine, George Washington University School of Medicine

Since 1926, when Wyckoff and Lingg reported a study of etiology in 1,001 cases of heart disease in New York City, similar attention has been given to the specific causes and types of cardiovascular morbidity in other parts of the United States. Headway has been made toward the three great objectives of (1) detailed, accurate information concerning the prevalence of heart disease in its several forms, (2) increased knowledge of the natural history of heart disease, and (3) a clearer idea of the need of the common use of acceptable criteria of diagnosis and treatment. In general, the factors of climate and race, of age and sex, of occupation and social and economic status, and of infection, degeneration and involution have been found just as important in the case of diseases of the heart as in tuberculosis.

---

[*] Read before the Washington Heart Association, November 18, 1932.

Our study deals with 1,200 unselected cases of structural heart disease in the District of Columbia. Since the most recently issued mortality statistics of the Bureau of the Census (Wyckoff and Lingg) show that among the large cities of the Country, Washington has the second highest cardiac death rate, and because here the opportunity exists to compare the incidence of heart disease in the two great racial groups of white and colored, we felt that such an analysis would be of interest.

Patients seen consecutively in the private practice of one of us and in the Cardiac Clinic of the George Washington University Hospital provide the nucleus of our material, which we extended by going to the records of the various medical services of the hospitals with which we have been associated, namely those of the George Washington University Hospital and Dispensary, the Gallinger Municipal Hospital and Freedmen's Hospital of Howard University. Cases were taken consecutively from the files until 600 patients of each racial group had been listed. Discontinuity of hospital service prevented personal observation of all of these patients and, therefore, we had the advantage of supporting our own diagnostic study of the majority of these cases with the findings and opinions of our colleagues in a lesser number.

Early in this survey we found ourselves in agreement with observations of others that no single series of patients, either hospital or private, is likely to give a correct picture of the incidence of heart disease. Among 3,715 admissions to Children's Hospital, for example, 34 cases of rheumatic heart disease were recorded in 1929, an incidence of 0.92 per cent (Leech). At Garfield Memorial Hospital the annual report for 1930 showed 5,331 admissions with 70 listed cases of heart disease an incidence of 1.31 per cent. In the examination of 14,506 pupils in the public schools of this city during 1931, Dr. W. C. Fowler's report shows an incidence of heart disease of 3.8 per cent. In our own study, among 700 admissions to the adult medical wards at Freedmen's Hospital in 1931, we found no less than 210 patients with cardiovascular disease, representing 5.1 per cent of the 4,093 total admissions to the hospital for the year. In 3,200 consecutive admissions to the Gallinger Municipal Hospital, 8.9 per cent of the patients had circulatory disease. In the George Washington University Dispensary, probably because it received many patients referred as cases of vascular disease from special clinics, actual or potential heart disease was found in approximately 12 per cent, while in the Hospital, possibly because a surgical and obstetrical clientele predominated, the recorded cases of heart disease were only 4 per cent. On account of these wide variations, we prefer the federal or district statistics. But here difficulties arise because these statistics are based on anatomical criteria of diagnosis, while we have followed the etiological classification of the Tuberculosis and Health Association in the belief, now generally accepted, that this furnishes the natural and most significant grouping of heart disease.

A summary of our etiological divisions in these 1,200 cases of structural heart disease by race and sex is shown in Table 1. Age distribution of the main etiological types is shown in Chart I. Before we comment on these findings, it is necessary to define the criteria which we have followed in making these divisions.

In the case of rheumatic heart disease the diagnosis usually offers no great opportunity for disagreement. There is a history of acute rheumatic fever and kindred manifestations, or the characteristic valvular lesions of mitral stenosis or aortic insufficiency are present. We may add that an apical systolic murmur without a significant rheumatic history has not been accepted as sufficient evidence of valvular disease. Less outspoken are the signs of pericarditis, acute and chronic, and of rheumatic myocarditis, evidence of which may be sought in physical, radiographic or electrocardiographic signs.

Syphilitic aortitis is recognized with certainty only when its late complications of aortic insufficiency and aneurism have appeared. In this series we have included less than half a dozen cases in which a presumptive diagnosis was based on substernal pain, dilatation of the aorta or bell-like aortic second sound (in the absence of hypertension), and a positive blood Wassermann reaction (Moore, Danglade and Reisinger). On the other hand, several times during the period covered by this study we have seen the anatomic evidence of aortitis that could be suspected from age, history and lesions elsewhere but which were not confirmed by physical or X-ray signs.

Concerning the diagnosis of thyroid heart disease there are open questions. When do tachycardia, overaction, dilatation and a systolic mitral murmur become significant of actual myocardial degeneration? These signs and even auricular fibrillation usually disappear after thyroidectomy, surgeons' notes regarding the heart are often scant, and short of heart failure the diagnosis of structural disease is hard to prove unless the thyrotoxicosis is of long standing.

Confusion in respect to the diagnosis and classification of heart disease is greatest in the case of hypertension and arteriosclerosis. Formerly perhaps this differentiation was thought hardly possible or worthwhile. At present, from the findings of cardiac hypertrophy and retinal vascular changes, pre-existing hypertension can often be inferred, and we agree with Levine and with Boas and Donner that the pathological physiology, age incidence and course are different for the hypertensive and the senescent types of vascular disease as these affect coronary, cerebral and renal vessels. Conner and Holt, on the other hand, found no striking predilection to coronary thrombosis in their hypertensive patients. We take the position that persistent hypertension always means potential heart disease, and we accept cardiac enlargement as the criterion for its actual diagnosis.* Clinical experience teaches us how unexpectedly in such a heart, apparently sound and with a large reserve, a coronary thrombosis may occur. Of course, arteriosclerosis unassociated with hypertension and cardiac hypertrophy may also produce the utmost myocardial damage.

Another difficulty, so far as the appraisal of etiological factors and classification are concerned, is found with the two large groups which in mortality statistics are placed under the anatomical diagnoses of cerebral hemorrhage and chronic nephritis. In both instances we regard hypertension as by long odds the chief etiological factor. A terminal cerebral hemorrhage often masks hypertensive heart disease of many years' duration and "nephritis" is frequently a misnomer which entirely disregards the nature and course of the pathological process. The present situation is summarized by Scott when he says that "to bring diagnosis and treatment abreast of modern conceptions there must be a more general appreciation that 60 to 70 per cent of patients with so-called essential hypertension die of myocardial insufficiency, about 20 per cent of cerebral accident and approximately 10 per cent only of renal insufficiency." As a practical point, it is frequently impossible during life to predict the eventual picture.

In this series of patients the first notable finding is the small percentage of rheumatic heart disease. A combined incidence of 6 per cent is particularly striking to those who have been accustomed to the frequency of 30 or 40 per cent, or more, in New York and New England (Jones and White). We believe that the relative mildness of the climate of Washington is the differential factor; since the establishment of the United States Weather Bureau in 1871 the average winter temperature here has been 35.4°F. The epidemiological studies of Paul and of Coburn offer the most recent evidence in favor of the great importance of this climatic influence. Once acquired, however, the disease follows the same course as elsewhere and in both races and in both sexes less than 10 per cent of rheumatic heart patients live past the age of 50 years. From our data, rheumatic heart disease is somewhat more prevalent in the white race and in the female sex.

---

* Cardiac hypertrophy due to essential hypertension is not universally accepted as evidence of cardiac disease. Also, hypertension and coronary arteriosclerosis often co-exist.—*Editor.*

Syphilitic aortitis was found in 20 per cent of the male negroes with structural heart disease, in 9 per cent of the negro women, in 7 per cent of the white male patients and in only 1.3 per cent of the white women. Even the highest of these percentages, however, is much lower than previous findings elsewhere, and is part of the encouraging evidence that education in personal hygiene and in measures of prevention and early treatment are having a favorable effect in the colored population. While the bulk of syphilitic aortitis and its complications are found in the middle years, the demonstration of 6 cases in negroes under 30 years of age and in 14 patients over 60 years of age, indicates that these conditions must enter into differential diagnosis from youth into old age.

The outstanding finding in this study is clearly the prevalence of hypertension. In both the colored and white groups, which as it happened are closely balanced as to sex, the susceptibility of women to hypertensive disease is striking. This high incidence, ranging from 46 per cent for the white males to just over 60 per cent for the negro females is considerably greater than in most previous statistics, but is supported by McNabb's finding of 52 per cent of hypertensive disease in the course of 200 consecutive necropsies of persons dead of heart disease in the Canal Zone and by Schwab and Schulze's percentage of 57.2 for hypertensive disease in Texas.

In the hypertensive white patients we found 42 cases, or 14 per cent, without evident secondary changes, compared with 57 cases (16 per cent) of simple hypertension in the negro group. Angina pectoris was found in 21 hypertensive white patients, or 7 per cent, and in 16 negroes, or 4.5 per cent. Coronary thrombosis was found in 8 white persons of the hypertensive group, and in 3 negroes. With the exception of a few patients with frank cardiac hypertrophy only, the remainder of the hypertensive group could be placed under the heading of myocardial degeneration, with symptoms and signs of congestive heart failure and often with electrocardiographic evidence of structural damage.

Since much of our hypertensive heart disease is absorbed in mortality statistics under the headings of cerebral hemorrhage and chronic nephritis, it is of interest that 24 cases of cerebral accident (8 per cent) had occurred in the white group and 47 cases (13.2 per cent) in the colored hypertensives. Nine white and 12 colored hypertensive patients had uremia. It may be emphasized again that in a clinical study, and particularly in the ambulant patient, the end-result, whether cerebral or renal, is frequently not predictable, even when the heart already betrays the effects of persistent high pressure.

Arteriosclerosis of decrescent or senile type takes second place as a cause of heart disease in the white group, and is less important than syphilis in the negro group. The arteriosclerotic heart, as might be expected of a disease related to physical wear and tear, is found twice as often in males as in females. But it is also twice as frequent in the white patients as in the negro, a fact which is to be explained by both the increased prevalence of vascular disease of hypertensive and syphilitic nature and by the precocity of its appearance and course in the negro. In this respect, of the white hypertensive patients, 1.6 per cent of cases were under 30 years of age and 53 per cent under 60 years of age, compared with 5 per cent under 30 years of age and 75 per cent under 60 years of age in the negro patients. In the series of arteriosclerotic heart disease, 27 per cent of the white patients and 55 per cent of the colored patients were under 60 years of age. The graphic chart shows this peak of incidence of both hypertensive and arteriosclerotic heart disease a decade earlier in the negro than in the white, and it also reveals the earlier appearance and more rapid rise of hypertensive, compared with arteriosclerotic, cardiac changes.

The white arteriosclerotic patients contributed 20 cases of angina pectoris and 15 cases of coronary thrombosis, while the colored series added 10 instances of angina and 2 of thrombosis. For the whole series, the incidence of angina was 6.9 per cent (41 cases) in the white group and 4.5 per cent (26 cases) in the negro group. The latter figures approximate those of 5.6 per cent found in negroes in Virginia. The incidence of thrombosis for the 600 white patients was 3.8 per cent (23 cases) and for the negro series, 0.8 per cent (5 cases). Five of the 8 cases of thrombosis in white hypertensive patients occurred before 60 years of age. Nine of the 15 arteriosclerotic cases were in patients over 60 years of age. The male preponderance in cases both of angina and of thrombosis was notable. In the 41 anginal cases in white patients, there were 30 men and 11 women, in the 21 instances of thrombosis 16 men and 5 women. In the negro group, 15 men and 11 women had anginal pain, but 5 men only were found with thrombosis. In our private series the percentages for angina and thrombosis were 10.9 and 9.6 respectively, in contrast with percentages of 5.4 for angina and 1.8 for thrombosis in the balance of the white group. This discrepancy in diagnosis is familiar; it has recently been the subject of a careful clinico-anatomical analysis at the Presbyterian Hospital in New York.

In closing, a glance at the background of heart disease in Washington and elsewhere in the United States may give a certain perspective to our own study.

According to the most recent mortality statistics of the Bureau of the Census, the death rate from heart disease in the registration area for 1929 was 210.8 per 100,000. These deaths, numbering 245,244, made up 17.7 per cent of the total. If we add deaths from cerebral hemorrhage and from chronic nephritis (nine-tenths of which, we believe, rest upon the etiological basis of hypertension), 32.8 per cent of the total deaths are linked up with cardiovascular disease.

Compared with this general rate of 210.8, the Washington cardiac death rate for 1929 was 334.0 per 100,000, the white rate being 300.3 and the negro 424.9. The ratio of cardiac to total deaths was 23 per cent for the white race, 19.9 per cent for the negro.

Only two cities in the country showed a higher cardiac death rate than Washington; Albany had a rate of 394.8, and the boroughs of Manhattan and Richmond in New York City had rates of 311.4 and 397.3, respectively. Two cities also showed a higher colored death rate from heart disease than Washington; New Orleans with 496.1 and Louisville with 467.2. The neighboring cities of Baltimore and Richmond showed cardiac death rates of 257.8 and 235.7 for the white population and 302.4 and 357.6 for the colored population. Nineteen states had death rates of over 200 per 100,000 from heart disease, and Oklahoma showed the minimum rate of 105.4.

SUMMARY

A study of the etiology in 1,200 unselected cases of structural heart disease in the District of Columbia has been made. The incidence of several types are reported according to race, sex and age.

Hypertension has been found the outstanding cause of heart and vascular disease in both negro and white races.

TABLE 1

Etiologic Types of Heart Disease in 1,200 Patients

PROBABLE CAUSES	WHITE				COLORED			
	M	F	T	Per cent	M	F	T	Per cent
Rheumatism	18	25	43	7.2	12	16	28	4.7
Syphilis	22	4	26	4.3	60	33	93	15.5
Hypertension	138	170	308	51.4	147	208	355	59.2
Coronary arteriosclerosis	102	54	156	26.0	52	28	80	13.3
Hyperthyroidism	1	21	22	3.7	0	7	7	1.2
Bacterial endocarditis	4	7	11	1.8	4	2	6	1.0
Other	17	17	34	5.6	11	20	31	5.1
Total	302	298	600	100.0	286	314	600	100.0

Arteriosclerosis in the white race and syphilis in the negro race, take second place in causing cardiovascular disease. The former follows closely upon syphilis among the negro patients.

Rheumatic disease shows a notably low incidence compared with its prevalence in more rigorous climates. It takes third place in etiological importance in the white series, fourth place in the colored.

Comments are made upon criteria of diagnosis and upon the discrepancies which arise with varying modes of classification.

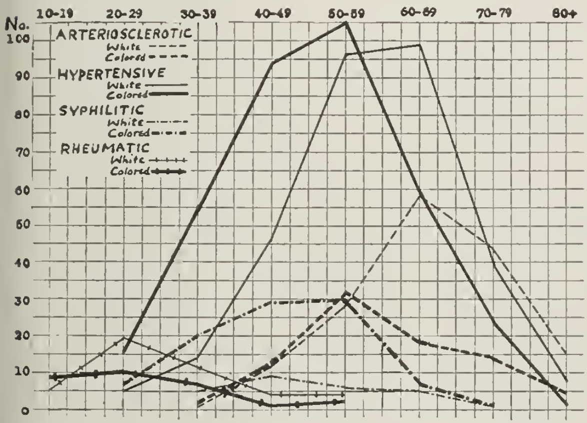


Chart I. Showing Number of Cases of Arteriosclerotic, Hypertensive, Syphilitic, and Rheumatic Heart Disease in 600 White and 600 Colored Patients

The relatively high mortality from heart disease in Washington has been pointed out. Obviously this is in part due to the concentration of patients in the various medical centers and institutions of the District of Columbia. But here as elsewhere the prevalence of heart disease, the frequent prematurity of its appearance, its apparent predilections, its occurrence as the natural consequence of certain infections and pathological states create a situation and an opportunity for study and improvement.

BIBLIOGRAPHY

Boas, E. P., and Donner, S.: Coronary Artery Disease in the Working Classes. J. A. M. A., 1932, **98**, 2186.

Coburn, A. F.: The Factor of Infection in the Rheumatic State. Baltimore, Williams & Wilkins, 1931.

Conner, L. A., and Holt, E.: The Subsequent Course and Prognosis in Coronary Thrombosis. Am. Heart J., 1930, **5**, 705.

Criteria for the Classification and Diagnosis of Heart Disease. 3rd Ed. N. Y. Tuberculosis and Health Assn., 1932.

Fowler, W. C.: Annual Report of Health Officer, District of Columbia, 1931.

Jones, T. D., and White, P. D.: Heart Disease and Disorders in New England. Am. Heart J., 1928, **3**, 302.

Leech, F.: Personal Communication.

Levine, S. A.: Coronary Thrombosis: Its Various Clinical Features. Baltimore, Williams & Wilkins, 1929.

Levy, R. L.: Some Clinical Features of Coronary Artery Disease. Am. Heart J., 1932, **7**, 431.

McNabb, P. E.: Personal Communication.

Moore, J. E., Danglade, J. H., and Reisinger, J. C.: Diagnosis of Syphilitic Aortitis Uncomplicated by Aortic Regurgitation or Aneurysm; Comparison of Clinical and Necropsy Observations in 105 Patients. Arch. Int. Med., 1932, **49**, 753.

Mortality Statistics, 1929. 30th Annual Report, Bureau of Census. Washington, 1932.

Paul, J. P.: Epidemiology of Rheumatic Fever. Metropolitan Life Ins. Co., N. Y., 1932.

Schwab, E. H., and Schulze, V. E.: Heart Disease in the American Negro of the South. Am. Heart J., 1932, **7**, 710. Ibid. 1931, **7**, 223.

Scott, R. W.: Hypertensive Heart Disease. Am. Heart Assn. N. Y., 1932.

Wood, J. E., Jr., Jones, T. D., and Kimbrough, R. D.: The Etiology of Heart Disease; A Clinical Study of 623 Cases with Certain Observations on Race and Climate. Am. J. M. Sc., 1926, **172**, 185.

Wyckoff, J., and Lingg, C.: Etiology in Organic Heart Disease. Am. Heart J., 1926, **1**, 446.

THE CURE OF MASTOID FISTULA WITH FAT-GRAFT*

Report of a Case

A. B. Bennett, M.D.
Washington, D. C.

The old conception that the presence of fat was inimical to the rapid healing of wounds has given way to the modern thought that fat is a source of nourishment in the healing of tissues. Fat has been used successfully in the orbit after enucleation and has proven itself to be very resistant to infection; it has also been used to elevate depressed scars by excising the scar and suturing the freshened edges over a layer of fat. In the *Archives of Surgery*, July 1930, Hartwell brought out the marked advantage of fat in the healing of surgical wounds. It is primarily due to the general surgical interest of this procedure that I am reporting this case to the Society.

---

* Read before the Society, February 15, 1933.

REPORT OF CASE

The patient, a white boy, 7 years of age when first seen in September, 1923, gave the history that 4½ years before he had had a left mastoid operation, followed by normal recovery. He was now suffering from a bilateral suppurative otitis media with bulging of both membranes, and the scar over the left mastoid was swollen and fluctuating. A double myringotomy was performed and both ears returned rapidly to normal. He remained well until 8 years later, when on July 13, 1931 he reported with a left acute suppurative otitis media with marked swelling, superior and posterior to the auricle, associated with bulging of the left tympanic membrane. A left myringotomy was performed, and the next day the swelling back of the ear had disappeared and he felt much better. Three days later the post-auricular swelling returned. There was drooping of the posterior-superior angle of the canal and a pulsating discharge escaping through the wound in the membrane. A simple mastoid operation was advised. This was done the following day, July 18, 1931. There was found a large subperiosteal abscess with a small opening through the cortex from the previous operation. The mastoid cells were filled with pus and their walls were soft and easily curetted. The exenteration was very extensive, extending from the post-zygomatic cells to the tip and posteriorly. The patient's recovery was rapid and his temperature became normal on the third day. The wound drained freely at first and then apparently began to heal with the normal filling-in of healthy granulation tissue. During August the wound was dressed regularly by the family physician and I saw the patient next in September. The lower half of the wound was covered by a normal scar, but over the upper half there was a round, dry scab which I removed, revealing a fistula about the size of my little finger. It was lined with mucous membrane extending from the skin surface to the mastoid antrum. There was no pus nor inflammation. The mucous membrane lining the fistula appeared as normal as mucous membrane elsewhere. The lower half of the wound had healed normally by granulation, and the upper half of the wound had healed by an extension of the mucous membrane outward from the middle ear and mastoid antrum. The tympanic membrane had healed and was normal in appearance. An x-ray plate showed a large exenteration with a few cells present posteriorly which appeared normal. The blood Wassermann reaction was negative. Since there was no discharge nor evidence of infection, I assumed that the fistula was simply due to faulty healing and treated it from September, 1931 to June, 1932 in an attempt to close it by palliative and conservative means. Many times I curetted away the lining membrane and allowed the wound to fill with blood clot protected only by a sterile dressing. Many times I tried packing tightly or, on the other hand, packing lightly. I used Balsam of Peru and Sulzberger Powder, both with the same result—the fistula remained the same. During this time the patient was attending school and made good progress in his studies and athletics. Much of his spare time was spent in hunting and fishing. During a severe cold there was visible a catarrhal mucous discharge from the fistula. In the *Archives of Otolaryngology* of April, 1932 there appeared an article by Clarence R. Straatsma, M.D., of New York, and Lyndon A. Peer, M.D., of Newark, N. J., entitled "Repair of Post-Auricular Fistula by Means of a Free Fat-Graft." The paper stated that 15 cases of post-auricular fistula had been successfully closed by this method and was illustrated by photographic cuts of the steps of the operation on cadavers. Operation was decided upon and performed June 14, 1932 at Garfield Memorial Hospital. Dr. Herbert H. Schoenfeld dissected fat from the abdominal wall while I prepared the wound for the fat-graft. The edge of the fistula was removed by a circular incision and the periosteum elevated an inch or more posteriorly to permit approximation without tension. The fistula was thoroughly curetted to remove the lining mucous membrane and then the free fat-graft was introduced, filling the fistula from the antrum to the surface. Anticipating some shrinkage of the graft, this last procedure was slightly overdone. A small, rubber dam was placed as a drain along the inferior wall of the fistula, and the wound was closed with heavy silk sutures, the skin and periosteum being included in each suture. There was no reaction from the operation and the patient left the hospital on the fourth day. The sutures were removed on the sixth day. There was an accumulation of serosanguineous fluid in the abdominal wound which was released; perfect healing followed. For the following 6 weeks there was only a slight oily discharge from the post-auricular wound; otherwise the wound was clean. On August 1, the wound was dry for the first time and quite depressed in the center. When I saw him again on November 10 the wound was closed, there was very little depression and the patient was discharged as cured.

DISCUSSION

Dr. H. H. Schoenfeld: Dr. Bennett's case report and the discussion are most interesting. He is to be congratulated on calling our attention to this method of treatment. I found it particularly interesting and enjoyed the small measure of coöperation of which I was capable in this case. The use of the principles involved here are not new. Fat transplantations or grafts have been more or less successfully used for a number of years. Czerny made autoplastic fat implantations upon the site of an amputated breast in 1893, and since that time successful transplantations have been made to fill out depressions on the face, breast, and also in the orbit after enucleation. Bone cavities have not infrequently been treated by transplantations, and we are all aware of the use of fat transplantations to avoid adhesions after operations upon joints and after the freeing of nerves bound by scar. We have always thought of fat as being a tissue that could be easily devitalized and prone to infection, but apparently, particularly in sinuses involving bone, the fibrous elements of the fat and bone unite without great difficulty, and results of such treatment appear very satisfactory.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D. C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D. Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1932–33
President .... Harry A. Fowler, M.D.
1st Vice-President .... Henry R. Schreiber, M.D.
2nd Vice-President .... H. Gladys Kain, M.D.
Secretary-Treasurer .... Coursen B. Conklin, MD.

THE PRACTITIONER'S SCIENTIFIC BETTERMENT

Opportunities Afforded by Organized Medicine

The main duty of the practicing physician is unquestionably the conscientious treatment of his patients. That his obligations as a physician do not end here, however, is no less certain. One of his most important duties is that of constantly refreshing his mind on medical matters by reading good medical literature and by attending scientific medical meetings. Conscientious performance of his main duty demands this. But the physician is busy, he owes something more than economic support to his family, and he needs recreation and exercise to remain physically fit. It is essential, therefore, that he use good judgment in selecting his medical literature and the meetings he attends. For the busy general practitioner it is probably sufficient to confine his medical reading to a careful perusal of The Journal of the American Medical Association, which not only contains articles usually of practical value but also abstracts of valuable articles from many other journals. For the specialist this journal is also important because of the general information therein. In addition he must keep abreast in his special field by reading the main journals dealing with the specialty.

Attending medical meetings was considered by Osler to be an obligation, and he was always very diligent in so doing. It seems to be more difficult for most physicians, however, to attend meetings than to read. This is probably largely because the reading may be done at odd moments when the spirit is willing and the reading matter selected by himself, whereas the meetings are held at stated times and the program arranged by others. Also, there are so many medical meetings and so many medical societies, especially in Washington, that one's time in meetings must be divided among several societies. Surely there can be no question, however, that to the Medical Society of the District of Columbia, a constituent of the American Medical Association, each member owes his most loyal support. The greatest number of physicians belong to this organization, and for this reason the scientific program can be better selected. It is far from edifying, however, to note how often out of a membership of over 700 the meetings are rather poorly attended. There are several reasons for this. First, any one program may not appeal to many members, second, the physician may be weary of meetings and third, he may consider himself sufficiently well posted without hearing the papers and discussions. The general practitioner may feel that he will not profit by hearing papers on special subjects, and the specialist may consider it of little value to hear papers on subjects outside his special field. These are fallacies. The wide-awake practitioner must know what is going on in the specialties because he should know what the specialists can do for his patients. The specialist, on the other hand, is a poor specialist unless he has a broad knowledge of medicine in general and of the other specialties. It is true that papers presented before the Society are not always well prepared nor always well delivered. Physicians do not attend medical meetings, however, to be entertained but to learn, and they must expect some "chaf with the wheat."

The smaller medical societies have a place in the world, although there may be too many of them. Their main function is more a social than a scientific one, although they serve to give physicians a chance to learn to write and to speak. They are naturally restricted as to membership. They in no way supplant the Medical Society of the District of Columbia, however, since that embraces all reputable physicians and has much broader functions. It would appear, therefore, to be unwise for physicians to belong to many smaller societies if it means neglect of the main Society. All other society activities should be secondary as compared with those of the parent organization. The physician's obligation to the Medical Society of the District of Columbia is an obligation to himself, his profession and his patients.

A physician's attendance at meetings of local societies is not sufficient, however. It is quite as important to get other than local viewpoints. For this purpose physicians should attend at least one convention or scientific session of a national organization annually, as, for instance, the Annual Convention of the American Medical Association or the Annual Clinical Session of the American College of Physicians. To visit some large clinic or a hospital where interesting clinical and investigative work is being done is another way of broadening one's outlook and increasing his knowledge. It is within the power of every physician to make his professional life a romantic and enthralling one.

AN ANNUAL BANQUET

The banquet of the Medical Society held at the Shoreham Hotel on the evening of April 24 in connection with the Fifth Annual Clinical Session of the Society has been acclaimed a great success. The banquet was well attended. The brilliancy and laughter of the ladies added great charm, and the entertainment by members of the Society was really entertainment. The event has raised the question again of the advisability of merging the annual banquets of the many smaller medical societies of Washington and having one main annual occasion of the kind under the auspices of the Medical Society of the District of Columbia. Many advantages would certainly be derived therefrom. Many evenings would be saved for the busy physician, expenses would be greatly curtailed and the presence of the ladies would greatly augment the pleasure of the occasion. The success of the recent banquet will undoubtedly assure the establishment of this event as a permanent feature of the Annual Clinical Session of the Medical Society of the District of Columbia.

TRANSACTIONS OF THE SOCIETY

Stated Meeting, May 3, 1933

The following were duly elected to membership:

Active Members

Philip Alexander Caulfield, 1861 Mintwood Place, N.W.
Frank Duncan Costenbader, 1726 Eye Street, N.W.
William DeKleine, 3000 Tilden Street, N.W.
Frank Stephen Horvath, 1801 Eye Street, N.W.
Allan E. King, Columbia Hospital.
Gilbert H. Mankin, 1726 Eye Street, N.W.
Beveridge Miller, 3600 Edmunds Street, N.W.
Isaac J. Silverman, 1201 D Street, N.E.
Charles William Tegge, 1801 Eye Street, N.W.
Eugene E. Willison, 2121 New York Avenue, N.W.

Associate Members

Errett C. Albritton, 5437 Nebraska Avenue, N.W.
Alfred T. Bronaugh (Pharm. D.), 14th & Monroe Streets, N.W.
Sanford M. Rosenthal, 1801 Eye Street, N.W.

Applicants for membership to be voted on in November, 1933:

For Active Membership

Weston Bruner, Jr., University of Pennsylvania—1930
Charles Troll Carroll, George Washington University—1931
Edgar Leonard Goodman, George Washington University—1929
Edward Jacob Grass, George Washington University—1927
John U. Schwarzmann, George Washington University—1929

For Associate Membership

Nancy DuVal Campbell, Yale University—1931
Raymond Osborne Dart, Rush Medical College—1916
Oswald Fenton Hedley, Medical College of Virginia—1928
Bittle Cornelius Keister, College of Physicians & Surgeons, Baltimore—1882
Cecil V. King, Northwestern Medical School—1924

The Society approved the appointment of a general committee which would consist of physicians and laymen for the propagation of the work of education of the public to the end that the morbidity and mortality resulting from cancer may be reduced. It is understood that the chairman of this committee will always be selected from the membership of the Society, and further, that the President of the Society will be an ex officio member.

Pursuant to action of the Society, upon recommendation of the Executive Committee, a Tumor Registry will be maintained in the Society's Building, which will afford easily accessible information concerning neoplastic diseases in our community.

The following committees, pursuant to action of the Society, will be abolished, effective July 1, 1933:

Bequests Committee
Business Affairs Committee
Committee on Medical Clinics
Committee to Visit Sick Members
Hospitals Committee
Liaison Committee with Social Hygiene Society
Liaison Committee with Tuberculosis Association
Library Committee
Membership Committee
Periodic Health Examinations Committee
Traffic Committee

The following proposed amendment was presented, and will be voted on in November:

In line 1, Section 9, Article VII of the Constitution, change the word "Civic" to "Public." At the end of the first paragraph add, "It shall maintain subcommittees on communicable diseases, on tuberculosis, on venereal diseases, and on public sanitation, and shall appoint such other subcommittees from time to time as may be expedient to perform special duties as they may arise."

In the second paragraph, strike out the words after the word "President," and substitute the words "and shall consist of seventeen members."

The following resolution was adopted: *Resolved*, That the Davidson Lecture Fund be invested in United States Government Bonds and that subsequent to January 1, 1934, the honorarium presented to the physician giving the Davidson Lecture shall be equal to the income derived from these bonds. This amount of money to be in lieu of the $300 provided in the original Davidson Lecture resolution of May 1, 1929.

Newly Elected Officers

To serve one year from July 1, 1933

President, Prentiss Willson
First Vice President, Daniel LeRay Borden
Second Vice-President, Margaret M. Nicholson
Secretary-Treasurer, Coursen Baxter Conklin

To serve two years from July 1, 1933

Delegate, American Medical Association, Henry Cook Macatee
Alternate, Frank Leech

To serve three years from July 1, 1933

Members, Executive Committee: Jerome F. Crowley
Harry Atwood Fowler
Ralph M. LeComte
Member, Program Committee: Arch Lockhart Riddick

ACTIVITIES OF SECTIONS*

Section on Nervous and Mental Diseases

Minutes of the Meeting Held February 2, 1933

The meeting was called to order at 8:15 P.M. by the Chairman, Dr. D. P. Hickling. The minutes of the two preceding meetings were read and approved. Members in attendance included Drs. H. D. Shapiro, J. L. Gilbert, M. L. Townsend, F. A. Moss, Lucile Dooley, K. H. Langenstrass, D. P. Hickling, Walter Freeman and C. C. Odom, with about 20 visitors. There was no business to transact. Dr. J. J. Shugrue was unable to read his paper on account of illness in the family.

Scientific Program

1. "Syringobulbia. Report of Case." **Frank Casey, M.D.**

Syringobulbia is a process similar to syringomyelia and often occurs in combination. The onset may be sudden but is oftener gradual, with diplopia, nystagmus, paralysis of the palate, vestibular symptoms and anesthesia or pain with sympathetic disturbances in the face. It usually comes with respiratory paralysis, which may begin suddenly. The most common site of the lesion is in the dorsolateral aspect of the medulla and may be a mere fissure or, in some cases, neoplastic.

---

* The editors will welcome such reports as the following from the secretary of any Section.

The patient was a colored female, aged 62 years, who had had spinal meningitis in childhood, with deafness and one blind eye. She showed tremors of cerebellar type, but little else was observed because of her inability to coöperate. She walked sideways and often fell. On one occasion her ear was sutured without any complaint of pain. Once a fall was followed by indications of cerebral hemorrhage. Necropsy revealed a large subdural hematoma, with hemorrhages in the midbrain and pons and a large cyst at the junction of the medulla and the cord. Serial sections showed degeneration of the dorsal fasciculi and gliosis, with a cavity in the upper portion reaching its maximum about the level of the pyramidal decussation and forming a rather deep groove on the mesial aspect of the substantia gelatinosa. Small remnants of the dorsal nuclei were found above, and the sensory decussation was fairly good. At the level of the olives, the cyst had disappeared and the cross-section was normal. Fresh infarcts were found in the midbrain, pons and globus pallidus, and rather extensive hydrocephalus. The cavity of the medulla, however, which was central, was believed to be developmental rather than post-meningitic because of the small communication with the fourth ventricle, the irregularity and the gliosis.

The main features were illustrated with lantern slides.

In discussion, **Dr. Walter Freeman** stated that the usual symptoms of syringobulbia were nystagmus and loss of pain and temperature sensibility in the face.

2. "Colloidal Gold Test, with a Note on an Improved Method of Making It." **Winifred M. Ashby, Ph.D.**

The colloidal gold test is an empirical one thus far, the precipitation being due to the discharge of the negative gold ions by positive protein ions. Future research should determine the iso-electric points of the proteins of the cerebrospinal fluid. Among the features to be controlled in the test, the chief one is the buffer gradient, which probably determines the three different zones of precipitation. In order that the buffer value of the gold should not destroy that of the cerebrospinal fluid, the colloidal gold is made with phosphate instead of carbonate. On account of its stability, an oxalate is used because it is completely changed to carbon dioxide, whereas formalin and glucose leaves buffers. Gold that is too acid may not precipitate, particularly in the first tubes. A highly dispersed gold, on the other hand, is less sensitive. The quality of the distilled water is of great importance, impurities of organic type tending to make a course gold. By distilling from permanganate over supercel, excellent water can be obtained, but the gold is too highly dispersed, and increasing the reducing agent may overload the buffer system. If the gold is too insensitive, the solution may be used as distilled water in making up another batch of gold and continued in this way until a gold of the desired sensitiveness is attained, when the whole may be diluted and adjusted to a pH 6.2 to 6.4. The hemoglobin check is satisfactory, the standard gold being precipitated in the first 4 tubes and no more in a dilution of 1 to 400. Each time the gold is run it is tested against a known negative and the 1 to 400 solution of blood. As it now stands, this colloidal gold is perfectly reliable and relatively easy to make.

In discussion, **Dr. Walter Freeman** mentioned the numerous difficulties that other laboratories had met and the value that a satisfactory gold test would have.

Dr. J. L. Gilbert was not convinced of the reliability of the colloidal gold test on account of the trouble that other laboratories had in making it.

Dr. C. R. L. Halley said that the mastic had replaced the gold test at Hopkins some years ago, that the solution was easier and simpler to make.

In conclusion, **Dr. Ashby** said that the changes in the spinal fluid of patients under treatment show in the gold where they do not show in the mastic test.

3. "Newer Aspects of the Catatonia Problem." (Motion Picture Demonstration.) **Karl H. Langenstrass, M.D.**

Until the advent of the Loevenhart method of treating stupor, care and cleanliness were all that could be offered. The cause was unknown and there was no ascribed pathology and no definite chemical disturbance. It was characterized by a prolonged dream-like state with muscular tension and deficient movement. The closest analogy to catatonia was obtained by intoxication by bulbocapnine. Dr. Langenstrass showed moving pictures of a cat under the influence of bulbocapnine. It was impossible to produce permanent catatonia in animals by intoxication. He then showed how experimental catatonia in a monkey might be entirely counteracted by the injection of cocaine and turned to the problem of discatatonization in man. This was done in a number of cases by the inhalation of carbon dioxide and oxygen, increasing the mixture gradually from 5 per cent to 30 per cent CO_2 until the patient began to talk, but not until he was narcotized. It was most important to combine this with psychotherapy, utilizing the increased suggestibility brought about by the gas in an environment of peace, friendliness and good cheer and following up with a program of systematic education. In some cases the results are only momentary, but the effect may be lasting and it may initiate the reintegration of the personality. Two cases were reported: one a recent catatonic cured by 1 treatment and discharged; the second one, a catatonic of 5 years' duration who regained her interest in music after 3 treatments and who could be discharged if there were anybody to whom she might go. While the patient's fundamental personality remains unchanged and he cannot be considered as cured, bringing him from his catatonic state makes resynthesis possible. Totality of therapeutic procedures is effective when one method fails.

In discussion, **Dr. F. A. Moss** asked about the use of cocaine in man. In reply it was stated that this was under investigation by Bychowski.

In response to a query by **Dr. E. C. Schneider**, it was stated by the essayist that he had had no experience with harmine.

Dr. D. M. Bullard wished to distinguish schizophrenia and paraergasia from dementia precox, since the precoxes have such a very bad outlook. The death wish has apparently come in catatonia.

Dr. J. L. Gilbert believed that catatonia represented a living death, that the patients were overwhelmed by their difficulties. He stated that the necropsy will show that the complexes present were superimposed upon poorly constituted individuals. Recoveries occur amongst those not so handicapped. Improvement occurs spontaneously occasionally, and the application of the treatment earlier in the psychosis might help.

Dr. Graven reported in detail the case of a Persian woman, aged 35, who developed an acute catatonic episode jumping from a window, sustaining many fractures. After prolonged gassing, this patient spoke and improved gradually, gaining weight.

Dr. Simon was unwilling to assign all the benefit to gassing, since the basal metabolic rate was minus 25 and improvement began when she was treated by thyroid and insulin, a high caloric diet and physiotherapy.

Dr. M. L. Townsend suggested that many patients improve in response to favorable attention, that psychogenesis of the catagonic state is the best explanation we have; results count.

Dr. F. A. Moss pointed out that animals intoxicated by bulbocapnine felt the burden of life and developed the death instinct but that cocaine throws off the burden which the bulbocapnine brings.

Dr. Walter Freeman pointed out that while psychotherapy was important the strenuous gas treatment must initiate the break in the vicious circle.

Dr. D. P. Hickling said that striking results might follow simple occupational therapeutic methods.

The meeting adjourned at 10:50 P.M.

NEW FACULTY MEMBERS OF THE GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE

Dr. Owen Stanley Gibbs

The chair of physiology at Georgetown University is to be filled by a new professor. The Medical School considers itself fortunate in securing Dr. Owen Stanley Gibbs, who has had a varied and interesting career, well fitting him for this new post.

Born at "Highbury" Sileby, Leicestershire, England, May 25, 1898, he attended Loughborough Grammar School, Montpelier Boys School, Paignton, Devonshire, and Leicester Technical School.

In 1921 he graduated with honors from the University of Edinburgh, receiving the degrees of M.B. and Ch.B. He spent the year 1920 studying practical obstetrics and gynecology in Paris.

At first an assistant to Professor Cushny in the Edinburgh University Pharmacology Department, Dr. Gibbs later (1923–1924) became lecturer in that department. The years 1924–1930 found him at Dalhousie University, Halifax, Nova Scotia, where he was professor of pharmacology and lecturer in toxicology. During the summer of 1930 he was visiting lecturer in pharmacology at Johns Hopkins Medical School. After some general practice (1930–1931) he had the opportunity as a Rockefeller Scholar (from the Medical Research Council of Great Britain) to study with Professor Pick in the Pharmacologisches Institute, Vienna. Dr. Gibbs, whose publications of original pharmacological and physiological researches number approximately thirty, comes to Georgetown from the University of Georgia Medical Department where he was professor of pharmacology and physiology.

Owen Stanley Gibbs, M.B., Ch.B.

Dr. Wilbur F. Potter

Dr. Potter will come to Georgetown as assistant professor of physiology under Dr. Gibbs. He obtained his degree of Bachelor of Arts from the University of Kansas in 1925, majoring in zoology. Later he obtained the degrees of Master of Arts and Doctor of Philosophy from the same university, majoring in physiology. From 1925 to 1930 he was instructor and assistant professor of physiology in the University of Kansas. Since 1930 he has been assistant professor of physiology in the University of Georgia School of Medicine. He has published a number of papers in the American Journal of Physiology.

GEORGE WASHINGTON UNIVERSITY POST GRADUATE CLINICS

On June 5, 6 and 7, 1933, there will be a series of clinics and demonstrations by the teaching staff of George Washington University School of Medicine. It is planned that the first day will be occupied at Gallinger Municipal Hospital. There will be included a noon-day luncheon. Clinics, demonstrations and ward rounds will be held in medicine, surgery, gynecology, obstetrics and pediatrics. On the second day, clinics and laboratory demonstrations will be given at the University Medical School and Hospital. On June 7, clinics at Children's, St. Elizabeth's Hospitals and other institutions will be held.

Of note on the first day scheduled at Gallinger Hospital are such surgical subjects as "Diseases of the Colon," "Diseases of the Lower Extremities," "Patterson Operation for Ascites," "Injection Treatment of Varicose Veins," "Hemorrhoids," etc. In medicine, "Peripheral Arterial Disease," "Newer Aspects of Pulmonary Tuberculosis," "Diabetes," "Pneumonia," and "Nephritis," will also be discussed. Numerous important subjects and clinical demonstrations in obstetrics and gynecology will be included.

Tuesday, at the Medical School and Hospital: "Ultramicroscopic Virus Diseases," by the dean of the school, Dr. Earl B. McKinley; "Adhesive Pericarditis," Dr. Sterling Ruffin; "Open Revision of the Prostate," Dr. Frederick A. Reuter; motion pictures, "Hernia, Anatomical and Clinical Aspects," Dr. Daniel L. Borden; a series of demonstrations of "Pelvic Endocrinology," Dr. Jacob Kotz. After a luncheon served at the school, there will be in the afternoon, such subjects as "Jaundice," "Duodenal Ucler," "Pathological Review," etc. Of particular interest will be an opportunity to review the work done in the biochemistry and other laboratories that have been newly built and equipped.

On Tuesday evening a dinner of the George Washington University Medical Alumni will be held at the University Club.

On Wednesday, clinical demonstrations and ward rounds will be given at Emergency, Children's, Garfield, Episcopal Eye, Ear & Throat, and St. Elizabeth's Hospitals. Inclusive will be a clinic on "Allergy in Children" at Children's Hospital; papers and demonstrations by Dr. William A. White and Staff, which will, it is believed, bring many visitors to St. Elizabeth's Hospitals.

While alumni of the school are expected to attend these demonstrations in numbers, the profession generally is cordially invited to attend all sessions. There are no fees. Obtain a full printed program from the office of the George Washington University Medical School and make arrangements now for your attendance.

MILWAUKEE, 1933

The American Medical Association meets in Milwaukee, Wisconsin, June 12–16, 1933. It is sufficient merely to make this announcement to stir up the type of enthusiasm, in any one who has ever attended one of these conventions, that results in making hotel and train reservations for those dates. For the benefit of all, it should be said that there is a special opportunity this year, not only to gain the inspiration from a real medical gathering, but to take in the Century of Progress Exposition at Chicago. In connection with the latter, the Chicago Medical Society will have a booth in the Hall of Science Building in Group K. In this booth, information for visiting physicians may be obtained. The Woman's Auxiliary of the Chicago Medical Society offer coöperation in the welcoming of wives and daughters of physicians. Milwaukee has always had special attractions about which nothing more need be said at this time. It is a beautiful lake city. Dr. Harry J. Heeb, 740 North Second Street, Milwaukee, is chairman of the subcommittee on hotels. A large delegation of Washington physicians should attend this eighty-fourth convening of the American Medical Association.

WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION*

ELEVENTH ANNUAL MEETING

Milwaukee, June 12–16, 1933

Headquarters: Hotel Pfister, Milwaukee, Wisconsin

PRELIMINARY PROGRAM

Monday, June 12, 1933

12:30 p.m. Luncheon at College Woman's Club in Honor of Past Presidents, followed by National Board Meeting and visit to American Medical Association Exhibits at Auditorium. Tickets $1.00.

7:00 p.m. Dinner for National Board, Delegates, and wives of Officers and Delegates of the American Medical Association at Woman's Club of Wisconsin. Musical Program furnished by Artist Members of Auxiliary to Medical Society of Milwaukee County. Tickets, $1.25.

Tuesday, June 13, 1933

9:00 a.m. General Meeting. Roof Room, Hotel Pfister. Mrs. James F. Percy, *Presiding*.

12:00 p.m. Luncheon and Bridge at the Wisconsin Club. Tickets $1.25.

2:00 p.m. Attractions available for those not wishing to play Bridge are Layton Art Gallery, Milwaukee Art Institute, Milwaukee Musuem, Curative Work Shop and Vocational School.

or

† Bus Trip to County Institutions, Milwaukee Children's Hospital Convalescent Home, and Washington Park Zoo.

8:00 p.m. General Meeting of American Medical Association.

10:00 p.m. Informal Dance at Wisconsin Club. Courtesy of State Medical Society of Wisconsin. Hostesses: Woman's Auxiliary to the State Medical Society of Wisconsin.

Wednesday, June 14, 1933

9:00 a.m. General Meeting. Roof Room, Hotel Pfister. Mrs. James F. Percy, *Presiding*.

12:30 p.m. Auxiliary Luncheon. Fern Room, Hotel Pfister. Guests and Speakers from the American Medical Association. Musical Program. Tickets $1.00.

4:00 p.m. Teas in Private Residences.

8:30 p.m. Light Opera. Tickets $1.00.

Thursday, June 15, 1933

9:00 a.m. General Meeting. Roof Room, Hotel Pfister. Mrs. James Blake, *Presiding*.

12:00 Noon. Trip to Oconomowoc Lake District. Luncheon 12:30 P.M., Carnation Milk Plant, Oconomowoc, Wisconsin, Transportation and Luncheon Courtesy of Carnation Milk Company.

or

12:30 p.m. Buffet Luncheon. Crystal Room, Hotel Pfister. Tickets 75 cents.

2:00 p.m. †Sight Seeing Tour of Milwaukee.

6:30 p.m. "Bring Your Husband" Dinner. Fern Room, Hotel Pfister. International-House-Cabaret. Tickets, $1.50.

9:00 p.m. President's Reception and Ball. Schroeder Hotel. Hosts: The American Medical Association.

Friday, June 16, 1933

10:00 a.m. Golf Tournament.

All trips start from Hotel Pfister.

MRS. ROCK SLEYSTER, *General Chairman,*
Wauwatosa, Wisconsin.

---

* All women attending this Convention whether Auxiliary Members or not are invited to participate in this entire Program.

† Bus transportation to be paid by individuals.

REPRINTS RECEIVED

The following reprints have recently been received for which due acknowledgment is made:

"Appendectomy for Swallowed Clinical Thermometer," Journal, American Medical Association, February 25, 1933, by George K. Nutting, M.D.

"The Importance of Molds as Allergic Excitants in Some Cases of Vasomotor Rhinitis," Journal of Allergy, January, 1933, by Harry S. Bernton, M.D., and Charles Thom, Ph.D.

"Urinary Proteose in Dermatoses," Archives of Dermatology and Syphilology, February, 1933, by F. J. Eichenlaub, M.D.

"Trans-Urethral Resection of the Prostate Gland," West Virginia Medical Journal, February, 1933, by W. D. Goodman, M.D.

"Two Unusual Types of Fistula—With Case Reports," Virginia Medical Monthly, February, 1932, by Julian M. Howe, M.D.

"Endocervicitis—Special Reference to Case Management," Virginia Medical Monthly, February, 1933, by Julian M. Howe, M.D.

"Premature Delivery and Death of the Fetus in Several Consecutive Pregnancies in the Same Woman: Case Report," Virginia Medical Monthly, October, 1931, by Julian M. Howe, M.D.

"Transplantation of the Intact Mammalian Heart," Archives of Surgery, February, 1933, by Frank C. Mann, M.D., James T. Priestly, M.D., J. Markowitz, M.D., and Wallace M. Yater, M.D.

"The Differential Diagnosis of Diseases of the Liver and Spleen by the Aid of Roentgenography after Intravenous Injection of Thorotrast (Thorium Dioxide Sol)," American Journal of Roentgenology and Radium Therapy, February, 1933, by Wallace M. Yater, M.D., and Laurence S. Otell, M.D.

MEDICO-LEGAL

DOCTRINE THAT AN ORDINARY PHOTOGRAPH IS THE BEST EVIDENCE OF WHAT IT CONTAINS DOES NOT APPLY TO RADIOGRAPHS

*Expert Opinion the Only Evidence to be Considered**

MARION VS. COON CONSTRUCTION CO. (NEW YORK), 1913, THIRD DEPARTMENT, VOL. 157, APP. DIV. 95.

In an appeal from judgment in lower Court, one of the errors alleged by the defendant related to the failure of the plaintiff to produce x-ray pictures concerning which expert witnesses for the plaintiff testified. On this point the Court said:

A careful reading of all the medical evidence and the other evidence as to injuries will show that the plaintiff was substantially injured. One of the plaintiff's witnesses, Dr. Gardner, swears: "I was present when the (x-ray) pictures were taken, saw them taken, saw them developed, and looked at the plates immediately after they were developed." Thus their identity and correctness were established. Then the Doctor proceeds to tell what the pictures show. Another physician, Dr. Tinker, also tells what he thinks the plates show. There was no demand made by the defendant for the production of the plates, no hint or suggestion that they were desired. They were, in fact, in court, so the plaintiff states in his brief. I can see no error at all in this x-ray incident. *The evidence shows that nobody but an x-ray expert could tell anything from the plates*, and that if they had been produced they would have done the court, jury, or the defendant's ordinary physicians no good. *I do not think that the doctrine that an ordinary photograph is the best evidence of what it contains should be applied to x-ray pictures. They constitute an exception to the rule concerning ordinary documents and photographs*, for the x-ray pictures are not, in fact the best evidence to laymen of what they contain. Generally, they are no evidence at all, signifying nothing whatever except to the expert. *The opinion of the expert is the best evidence of what they contain—the only evidence.*

---

* Excerpt from Radiography, Vol. IX, No. 1, p. 24, as quoted from article by Leon T. LeWald, M.D., in Radiology.

CONTAGIOUS DISEASE REPORT, APRIL, 1933

Health Department, District of Columbia

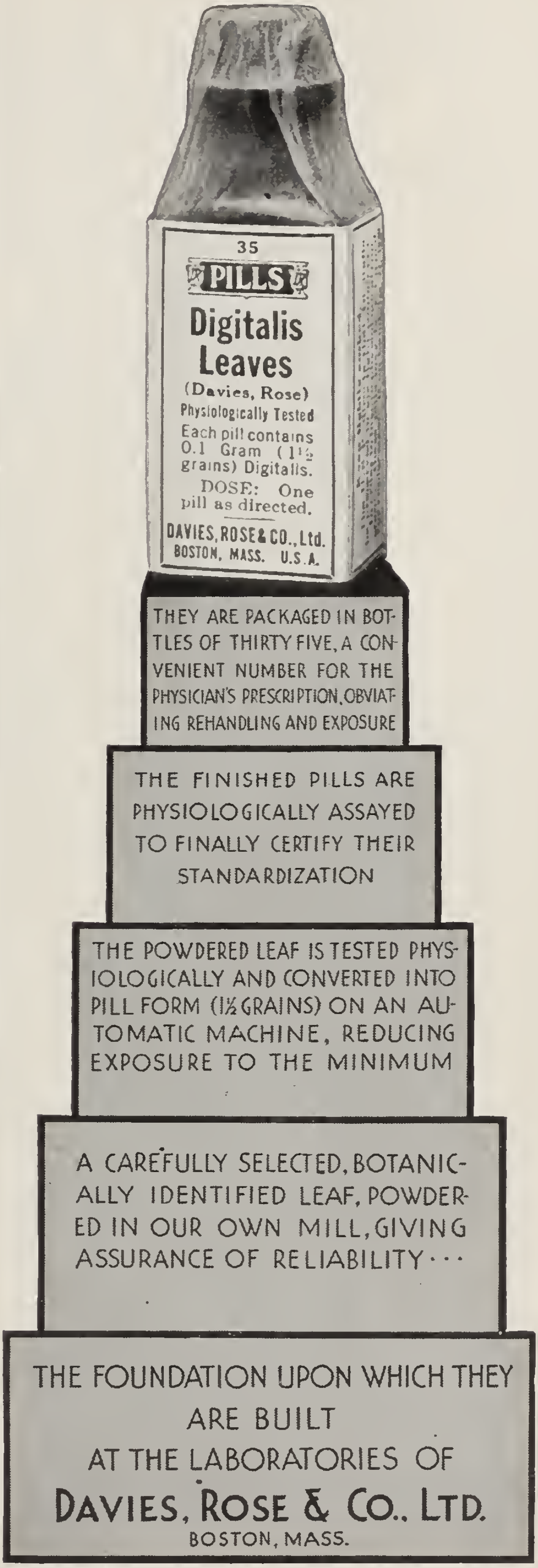
	Morbidity	*Mortality*
Typhoid fever	0	0
Typhus fever	0	0
Smallpox	0	0
Measles	34	0
Scarlet fever	57	1
Whooping cough	22	0
Diphtheria	17	0
Influenza	6	4
Poliomyelitis	0	0
Encephalitis-Lethargica	1	0
Epidemic Cerebrospinal Meningitis	3	0
Tuberculosis (all forms)	96	66
Syphilis	490	6
Gonorrhea	244	0
Chickenpox	146	0
Chancroid	7	0
Pellagra	1	1
Pneumonia (all forms)	84	28

MAXWELL
AND
TENNYSON
Pharmacists
Specializing in ℞ work and office supplies

Washington Medical Building
1801 Eye Street, N. W.
Na. 0525

Columbia Medical Building
1835 Eye Street, N. W.
Di. 9576

1726 Eye St., N. W.
Na. 9397


35
PILLS
Digitalis Leaves
(Davies, Rose)
Physiologically Tested
Each pill contains 0.1 Gram (1½ grains) Digitalis.
DOSE: One pill as directed.
DAVIES, ROSE & CO., Ltd.
BOSTON, MASS. U.S.A.

THEY ARE PACKAGED IN BOTTLES OF THIRTY FIVE, A CONVENIENT NUMBER FOR THE PHYSICIAN'S PRESCRIPTION, OBVIATING REHANDLING AND EXPOSURE

THE FINISHED PILLS ARE PHYSIOLOGICALLY ASSAYED TO FINALLY CERTIFY THEIR STANDARDIZATION

THE POWDERED LEAF IS TESTED PHYSIOLOGICALLY AND CONVERTED INTO PILL FORM (1½ GRAINS) ON AN AUTOMATIC MACHINE, REDUCING EXPOSURE TO THE MINIMUM

A CAREFULLY SELECTED, BOTANICALLY IDENTIFIED LEAF, POWDERED IN OUR OWN MILL, GIVING ASSURANCE OF RELIABILITY · · ·

THE FOUNDATION UPON WHICH THEY ARE BUILT
AT THE LABORATORIES OF
DAVIES, ROSE & CO., LTD.
BOSTON, MASS.

PHYSICIANS' LIABILITY INSURANCE

For further information write or telephone

FRANK R. STRUNK

SUITE 505-512 *Telephone:* National 1160 and 1106 1406 G STREET, N. W.

Under terms of a group policy approved by the Medical Society of the District of Columbia

FIRE - LIFE - AUTOMOBILE - BONDS

L. A. FORMULA

Lactose - 4 parts
Dextrin - 1 part
Psyllium Seed
Concentrate - 3 parts

FOR CHANGING THE INTESTINAL FLORA.

Also an intestinal lubricant.

Indicated in cases of constipation and excessive fermentation.

Send for sample.

NATIONAL VACCINE AND ANTITOXIN INSTITUTE

1515 U Street, N. W., Washington, D. C.

Phone: NOrth 0089

Service *Quality*

KLOMAN INSTRUMENT COMPANY, Inc.

WE DO expert Surgical Fittings, and are well equipped, to satisfy both the Doctor and his Patient.

Columbia Medical Building
Room 202

GOLF, AND INFANT FEEDING

It is possible to play over the entire course with a single club and bring in a fair score. But playing with only one club is a handicap. The best scores are made when the player carefully studies each shot, determining in advance how he is going to make it, then selects from his bag the particular club best adapted to execute that shot.

For many years, Mead Johnson & Company have offered "matched clubs," so to speak, best adapted to meet the individual requirements of the individual baby.

We believe this a more intelligent and helpful service than to attempt to make one "baby food" to which the baby must be adapted.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II JUNE, 1933 NUMBER 6

THE TREATMENT OF RECTAL CANCER*

J. OGLE WARFIELD, JR., M.D.
Instructor in Clinical Surgery, Georgetown University School of Medicine

Malignant lesions of the rectum are almost entirely carcinoma. Cancers of the rectum and rectosigmoid comprise 12 per cent of all cancers and three-fourths of cancers of the intestinal tract.

Few parts of the body are so favorable as the rectum for removal of malignancy, yet the first permanent cure did not occur until 1900. This patient, a woman operated on by the Kraske method in 1900, lived to a good old age 29 years after operation. The first 5-year cure of cancer of the sigmoid was accomplished by operation in 1902.

EARLY DIAGNOSIS

Recognition of early symptoms is important. These are blood in the stools and any change of bowel habit or bowel sensation. The diagnosis should be made in 100 per cent of cases by a digital and proctoscopic examination. Biopsy is valuable. X-ray studies are often misleading in cancer of the rectal ampulla. X-ray is valuable in rectosigmoidal lesions, but even here one or two negative studies do not rule out a malignant lesion.

MORBID ANATOMY

The only type of cancer in the rectum is the adenocarcinoma. Epithelioma occurs only at the anal margin. Clinically the varieties of cancer are: 1. Adenoid, 2. colloid or mucoid, 3. papilliferous, 4. scirrhous, 5. melanotic. The adenoid type is the common variety.

Cancer of the rectum spreads in three ways: 1. By direct extension, 2. by veins, 3. by lymphatics. Direct extention is slow. The tumor extends directly on the surface and through the thickness of the bowel wall. On the surface it grows circularly around the bowel and takes about six months to cover one-fourth of its circumference. In extending through the thickness of the bowel wall the muscularis becomes invaded and fixed to the mucosa in approximately this time.

The spread of cancer by the veins and lymphatics is more rapid and occurs before the muscularis is penetrated. The principal vein draining this area is the superior hemorrhoidal which empties into the portal circulation. Fortunately, metastasis by the venous system is rare. It is noted that liver involvement is generally late.

The most important route of dissemination of cancer is through the lymphatics, which are divided into two groups, intra-mural and extra-mural. The extra-mural lymphatics scatter in three directions: 1. Upward along the superior hemorrhoidal vessels to the retro-rectal glands, the pelvic mesocolon, and the iliac, lumbar and aortic glands; 2. laterally to the levator ani and coccygeus muscles, the pelvic fascia and peritoneum, the prostate gland, bladder, cervix, vagina, uterus and broad ligaments; 3. downward to the ischio-rectal fat, the external sphincter muscle, and the peri-anal skin and inguinal glands.

A little over half of the lesions occur at the rectosigmoidal juncture, where the growth ulcerates late, encircles the bowel early and produces obstruction. A little less than half occur in a rectal ampulla, where the tumor ulcerates early and grows slowly and in a circumferential direction. A very small percentage of lesions occur at the anal muco-cutaneous margin, where the malignancy is of the basal-cell type. The growth of rectal cancer is relatively slow and metastases are less common than in many cancers elsewhere.

---

* Read before the Society, March 15, 1933.

Types of Surgical Treatment

The treatment of cancer of the rectum developed slowly until the time of Kraske in 1885. Previous to that date operations employed were principally palliative. However, resection of the rectum for carcinoma was proposed in the early eighteenth century by Morgagni and successfully accomplished in 1739 by Faget. In 1826 Lisfranc used perineal excision with success, and Verneuil in 1873 first removed the coccyx.

In 1885 Kraske introduced the coccygeal and sacral approach for extirpation of rectal cancer. He removed the coccyx and the lower left portion of the sacrum. A sacral or perineal anus resulted. Modifications of the Kraske procedure soon followed. Some surgeons attempted to improve the exposure by removing larger portions of the sacrum up to the third sacral foramina and by devising different types of sacral bone flaps. Other surgeons attempted to restore the rectal canal and retain a sphincteric or manageable anus. Some of the principal methods which became known were: (1) Resection of only the neoplastic portion of the rectum and anastomosis; (2) amputation as advocated by Cripps, who did not loosen the upper rectum from its bed and used bougies to maintain a patent rectal canal; (3) the resection and pull-through operation of Quenu and Tuttle who removed the anal mucosa, pulled the sigmoidal end through the sphincter and fastened it in the anal canal; (4) the suggestion of Gersuny to twist the bowel a half turn to partly obstruct and in this way produce a more controllable perineal anus; (5) Willem's operation of drawing the rectum through a split in the gluteus maximum muscle; (6) Chetwood's method of suturing fibers of the gluteus maximus in a figure of eight around the terminal rectum; (7) Gant's operation of narrowing the terminal bowel by removing a V-shaped segment and snugly suturing the levator ani about the bowel. The various modifications had two main drawbacks, namely, non-union of the gut and tension leading to gangrene.

The vaginal route for the removal of rectal cancer was suggested by Desquins in 1890 and performed by Norton the same year. This approach was also modified to preserve the anal sphincter or produce a manageable anus.

During this period of the posterior or sacral, perineal and vaginal operations the surgeons aimed to radically remove the cancer, but they fell short of this because the area of upward lymphatic spread along the course of the superior hemorrhoidal vessels could not be reached. Therefore, the results were poor. Only 25 per cent of patients with rectal malignant lesions were operated on and of these 25 per cent lived for 3 years. Recurrences occurred in 100 per cent of cases.

The abdomino-perineal operation was the next step. This operation really dates back to Czerny who in 1883 unintentionally did a combined procedure for a high-lying growth. No attention was paid to it, however. In 1894 Maunsell deliberately did an abdomino-anal operation. The following year the abdomino-perineal operation was used by Quenu, Chaput and Gautier. In the next 3 or 4 years the combined method was advocated by Giordanos, Boekel, Reverdin, Keen and others.

In 1908 Miles published a radical, one-stage, combined abdomino-perineal operation. It included abdominal exploration, division of the bowel, colostomy, and mobilization of the rectum followed by posterior resection of the entire rectum. The objections to the Miles operation were its high operative mortality, its long difficult procedure, and the necessity of permanent colostomy. Changes in technic have naturally followed, but the chief alterations have been to reduce the mortality by dividing the procedure into 2 stages. Most operators since have included colostomy and insisted on high ligation of the superior hemorrhoidal vessels and their accompanying lymphatics.

W. J. Mayo in 1912 suggested radical removal of the rectum through the abdomen, leaving a short distal rectal stump loose, or to be attached to the sigmoid, or to be excised later through the perineum.

The Coffey operation published in 1915 consisted of division of the bowel, mobilization, inversion, and telescoping of the rectum and later posterior extirpation. In 1915 Jones offered a technic of mobilization of the distal bowel segment, but division of the bowel was not done until the second stage, when the rectum was removed posteriorly.

In 1931 Bartlett and, a little later in the same year, Rankin proposed doing the combined operation backwards by mobilizing the rectum posteriorly, pushing it up in the pelvis and at another stage removing it through the abdomen. Additional methods of doing the combined operation have been published by Schmieden, Lahey, Babcock and probably others.

The inguinal colostomy has come to be more preferred than the perineal or sacral anus. The first preliminary colostomy was probably done by Adams in 1882. Abdominal colostomy is certainly more accessible. It should no longer be feared, nor considered a last resort. Patients who have had colostomies and have had the tumor removed are contented and not disabled. The simplest colostomy is the best. None of them gives voluntary control. If the colostomized individual eats a constipating diet and thoroughly empties the colon by a daily morning enema, he is free from leakage. The secret of an efficient enema lies in preventing its return flow until it has been entirely given. This can be accomplished by a rubber dam or similar device. A properly performed colostomy requires only a simple dressing held in place by a girdle.

IRRADIATION THERAPY

Until 15 or 20 years ago rectal malignant lesions were treated only by surgery. At that time, however, radium and X-ray therapy were introduced. For the past 5 years the choice method has been implantation of radon seeds or radium needles into the growth and deep X-ray therapy of high voltage over the area of lymphatic spread. The needles have to be removed, but the seeds do not. Treatment with radium and X-rays gives the only relief in inoperable cases and for patients too old for operation. It may render inoperable cases operable. In the average case the treatment should be preceded by colostomy. Treatment with radium and X-rays is a valuable surgical adjunct, and when used together an interval of 6 or 8 weeks should intervene between such treatment and surgical measures. The first dose of radium is the most effective. Its effect is more striking in the epithelioma at the anal margin, and in younger patients. Gordon-Watson believes a patient under 30 years of age has more chance with radium treatment than with surgical. The location of the tumor no longer limits the use of radium. It should be used by skilled workers only.

Recently, electrothermic surgery has been popularized. To date it has been of little use in this field. It has its place, however, in the treatment of the anal epithelioma and pre-cancerous lesions.

RESULTS OF TREATMENT

Late statistics show that 50 per cent of patients are operable, 25 per cent are treated with radium, and 25 per cent have palliative colostomies or no operation. The operative mortality has been reduced to less than 10 per cent in capable hands. Statistics of operated cases show 50 per cent of 5-year cures. Surgery, then, offers a 5-year cure to one-fourth of patients with rectal cancer. I know of no statistics on radium therapy. Treatment with radium may eventually prove to be as valuable as surgical.

SUMMARY

All operable cases should have surgical treatment combined with irradiation. Inoperable cases should have irradiation preceded by colostomy as a rule. The operability of a patient depends, of course, on many factors.

Today we know that cancer of the rectosigmoid and of the rectal ampulla are different problems. In rectosigmoidal lesions there are usually obstruction and toxemia which add risk to an operation. Preliminary colostomy is often necessary, and sufficient time should elapse to establish normal gastro-intestinal function before radical extirpation of the tumor is attempted. The surgical principles of the large bowel must be applied in rectosigmoidal cancer. Occasionally resection of an inoperable rectosigmoidal malignant lesion is justified to avoid colostomy.

The best operation is the most extensive one that the patient will stand. No one operation has proved itself as the only acceptable procedure. The pre- and post-operative care are all-important. The anesthetic must be wisely chosen.

In conclusion, I think we should be encouraged in our fight against rectal cancer. To surgical treatment, for years the only method, has been added that of radium and X-ray. Our results have slowly but surely improved. I believe more can be done if the radiologist and the surgeon would coöperate and not compete in the treatment of rectal cancer.

BIBLIOGRAPHY

Babcock, W. W.: The Operative Treatment of Carcinoma of the Rectosigmoid with Methods for the Elimination of Colostomy. Surg. Gynec. Obst., 1932, **55**, 627.

Bartlett, W., and Bartlett, W., Jr.: A One-stage Combined Resection of the Rectum. Arch. Surg., 1931, **22**, 786.

Binkley, G. E.: Advantages of Radiation Therapy in the Treatment of Rectal Cancer. Tr. Am. Proct. Soc., 1930, **31**, 49.

Bloodgood, J. C.: Cancer of the Colon and of the Rectum. Ann. Surg., 1932, **95**, 590.

Bowing, H. H., Fricke, R. E., and Harper, F. R.: Treatment of Carcinoma of the Rectum by Radium. Am. J. Roentgenol., 1931, **25**, 644.

Burch, L. E.: An Easy Operation for the Removal of Cancer of the Rectum in the Female. Surg. Gynec. Obst., 1932, **54**, 794.

Coffey, R. C.: Cancer of the Rectum and Rectosigmoid. Am. J. Surg., 1931, **14**, 161.

Gant, S. G.: Diseases of the Rectum, Anus and Colon. Philadelphia, W. B. Saunders Co., 1923.

Gordon-Watson, C.: How Far Can Radium Replace Radical Surgery for Cancer of the Rectum? Ann. Surg., 1931, **93**, 467.

Gordon-Watson, C.: Some Experiences in the Treatment of Carcinoma of the Rectum with Radium. Surg. Gynec. Obst., 1932, **54**, 307.

Jones, D. F.: End Results of Radical Operations for Carcinoma of the Rectum. Ann. Surg., 1929, **90**, 675.

Jones, D. F.: The Diagnosis and Principles of Treatment of Carcinoma of the Colon and Rectum. Ann. Surg., 1931, **94**, 860.

Kaplan, I. I.: Radiation Therapy of Carcinoma of the Rectum. J. A. M. A., 1931, **97**, 991.

Keen, W. W.: Keen's Surgery. Philadelphia, W. B. Saunders Co., 1919, **4**, 154.

Lahey, F. H.: Two-stage Abdominoperineal Removal of Cancer of the Rectum. Surg. Gynec. Obst., 1930, **51**, 692.

Lewis, D.: Practice of Surgery. Hagerstown, W. F. Prior & Co., 1929, **7**, 86.

Mayo, W. J.: The Radical Operation for the Relief of Cancer of the Rectum and Rectosigmoid. Ann. Surg., 1912, **56**, 240.

Miles, W. E.: The Pathology of the Spread of Cancer of the Rectum, and its Bearing upon Surgery of the Cancerous Rectum. Surg. Gynec. Obst., 1931, **52**, 350.

Rankin, F. W.: Two-stage Resection for Carcinoma of the Rectosigmoid and Rectum. Surg. Gynec. Obst., 1931, **53**, 670.

Schmieden, V., and Fischer, A. W.: Die Abdomino-sakrale Rectumexstirpation. Arch. f. klin. Chir., 1924, **132**, 503.

Schreiner, B. F., and O'Brien, J. P.: A Study of 210 Cases of Carcinoma of the Rectum and Anal Canal, Treated Between 1914 and 1925 Inclusive. Am. J. Roentgenol., 1931, **25**, 654.

Yeomans, F. C.: Radon Needles in the Treatment of Accessible Rectal Cancer. Tr. Am. Proct. Soc., 1931, **32**, 99.

DISCUSSION

Dr. Joseph Horgan: I should like to comment upon the subject which has been so excellently presented by Dr. Warfield. Since Miles (1908) devised the abdominc-perineal operation for the treatment of cancer of the rectum and rectosigmoid, he has since found that the mortality factor could be decreased by accomplishing the abdomino-perineal resection in primary, secondary or such intermediate stages as were necessary to insure a favorable result. This has been the experience of others. The essayist has stated that he believes 6 to 8 weeks should intervene between the radium therapy and the surgical procedures. I should like to ask why? If this were true it would remove one of the advantageous features of radium therapy. I believe that if 10 days before operation radium is applied to the surface of the lesion and held in place by a plastic, rubber-covered, wire frame which can be bent to conform to the internal and external curvatures of the coccyx and sacrum and anchored externally by adhesive, the result will be that the terrific physiologic loss occasioned by bleeding and suppuration incident to the ulceration of the lesion will be controlled. The dosage varies from 1200 to 2400 millecurie hours. This markedly improves the surgical risk, aside from the other beneficial effects of the radium. The general plan of treatment should include first, preoperative study to determine the surgical risk, supportive care and focal radium therapy; second, surgical care, local in the case of a small lesion and general in the case of a large lesion including exploratory laparotomy, colostomy, and resection in such stages as the patient's condition may dictate; and third, the postoperative care, which should include further focal radium therapy and diffuse roentgen therapy.

Dr. Edwin A. Merritt: It seems to me that the main thing we have to obtain in cancer of the rectum is proper diagnosis. The digital examination is rarely made. That alone frequently establishes the diagnosis; its importance is obvious. Small lesions in the rectum should, theoretically, be cured by the use of radium. I say theoretically, because there has been practically none of that work done. However, you will recall that cancer of the tongue is being treated successfully today. Tongues are no longer being removed. If we can cure cancer of the tongue, it is reasonable that it can also be accomplished in the rectum. We should have more of the attitude as expressed by Dr. Warfield to back up this treatment. It will do away with the removal of the rectum, and to a working man it is almost an impossibility. Ewing of New York is the author of the statement that adenocarcinoma of the rectum is not cured by either the use of radium or surgical measures. That statement was made several years ago. I do not know whether he thinks it holds true today.

Dr. Francis R. Hagner: The patient mentioned by Dr. Warfield was a patient of mine. The gentleman came to me saying he thought he had some trouble with his bladder. I examined him on 2 occasions and referred him to Drs. Warfield and Kerr. They found he had cancer of the sigmoid. They did a good piece of work. He is a most active man, has charge of a large organization and works every day. He is apparently in perfect health, and it has been 4 years since the operation. It is one of the most brilliant cases I have ever seen.

Dr. W. M. Ballinger: I would like to ask a question in regard to rectal polyps. We are led to believe that they are often pre-cancerous. It has been our custom to excise them or if quite innocent in appearance to merely "spot" them and make examinations at 3 to 6 months' intervals. Some of these then undergo malignant change. I wonder if we might not be doing more for the patient in the way of implantation of a radon seed either alone or after ordinary excision.

Dr. Warfield (In closing): I wish to thank the gentlemen for their discussion. I mentioned the Mile's operation because that was one of the first abdomino-perineal operations to be advised just to show the sequence of events in the treatment of this disease. The interval between irradiation and surgical treatment, 6–8 weeks, must be allowed to give the radium time to complete its work. I use irradiation first in the hope that I may convert an inoperable case into an operable one. If the case is inoperable I do not attempt to remove the rectum. I understand properly filtered radium will not cause ulceration. As far as polyps go, I think they could be removed by radium, surgical or electrothermic therapy.

THE TREATMENT OF PROSTATISM BY RESECTION*

HORATIO N. DORMAN, M.D.

Washington, D. C.

Prostatism is the term applied to a chain of symptoms, the more common being frequency, urgency and difficulty in urination. These symptoms may be accompanied by varying amounts of residual urine. Complete retention may occur. In some cases there may be no residual at all. Prostatism is caused by some pathological condition which affects the tissues at the vesical outlet, usually the prostate gland. The etiology of these changes is not known in most cases. No satisfactory explanation has been given for either the acute symptoms in some cases in which very little excess of glandular tissue is found or for the entire lack of symptoms in other cases in which the gland is enormous. Suffice it to say that there is always some distortion of the vesical outlet. This distortion may be manifest by overgrowth of glandular tissue, contracture or sclerosis of the tissues around the vesical outlet or a combination of the two conditions. Omitting for the present changes caused by malignancy, we may classify the remaining obstructions roughly under two headings, the one characterized by the presence of little or no glandular tissue, but rather a sclerosis; the other characterized by a large amount of glandular tissue or hypertrophy. There are, of course, all gradations between these two extreme conditions. We have, then, on the one hand a moderately or greatly enlarged gland, and on the other a small gland or sclerotic ring. The symptoms produced by these two conditions may be identical. The patient needs relief from one condition just as much as from the other. Untreated or unrelieved symptoms of prostatism can lead to one end only, destruction of kidney tissue, uremia and death.

TREATMENT OF PROSTATIC HYPERTROPHY

Prostatectomy has been the only treatment for the greatly enlarged gland in the past. The operation has been well standardized during the past 30 years. We know how to prepare the patient, how and when to operate, how to care for the patient after operation. The end results, considering the age and physical condition of these patients, are good. It cannot be denied, however, that the laity considers prostatectomy as one of the most hazardous and dreaded operations. This fact deters most men from submitting to operation until it becomes imperative, with the result that when the patient does come for relief, his general physical condition is such that prostatectomy is a very serious operation. Thus, a vicious circle has been set up which the urologist in the past has not been able to overcome. That the condition exists is admitted by all. That the time is ripe for changing this condition is acknowledged by urologists. That an agreeable, safe and altogether satisfactory method is at hand for preventing the condition I shall hope to prove to you in the course of this discussion. The fact that more than 70 per cent of our male population reaching the age of 60 years are reasonably sure to need some form of relief from their symptoms of prostatism makes this subject well worth our serious consideration.

---

* Read before the Society, March 15, 1933.

Treatment of Small Obstructions

Let us consider the man with the small gland, the man with a sclerotic ring or possibly just a beginning hypertrophy, the so-called border-line case. The treatment, or rather the lack of treatment, which many of these patients have received in the past is little short of criminal. Take, for example, the patient who complains of a little frequency, say twice a night, a little hesitancy in starting the stream and a little loss of force of the stream. There may be little or no residual urine. The prostate per rectum is only slightly enlarged, possibly not at all. At cystoscopy no intravesical lobes are found. There may be slightly bulging lateral lobes in the posterior urethra, or a small middle lobe. In other words, there is just a beginning enlargement. What has been our advice to these men? I do not hesitate to say that I believe all sane, conservative urologists have advised a period of watchful waiting for men in this condition. We have sent the patient away with the advice that he has a beginning enlargement, that it will undoubtedly continue to grow, that his troubles will increase and that some day, if he lives long enough, an operation will have to be done. What has been the inevitable result? Our patient has accepted our prophecy that his troubles will increase, and he has borne his sufferings patiently and long in the hope that something would happen to prevent the inevitable operation. The result is that the patient not only spends his days in anticipation and fear and his nights in miserable dribblings, but he is daily lessening his chances for a successful termination of his troubles. The profession is to blame for many such conditions, and to that extent is responsible for gross negligence. Add to these cases the number of patients who take matters in their own hands and never seek medical advice until it is absolutely necessary, and you will appreciate the fact that the majority of men who finally seek relief are very poor surgical risks because of incipient uremia, cardiovascular disease, etc.

It is true that some of the cases in this group, particularly those characterized by a median bar, have been treated by some form of transurethral punch operation by a few urologists during the past decade. This procedure has never become popular, and the majority of these patients have been allowed to go unrelieved, while a few have submitted to open operation.

The fundamental purpose of this paper is to acquaint you with the fact that prostatectomy with its definite mortality, its protracted morbidity, its long hospitalization, its many sufferings, great expense and disagreeable odors, is rapidly becoming an operation of the past. The patient who seeks early relief need never be subjected to prostatectomy. Urology is ready to take its place in the field of preventive medicine and declare that prostatectomy is obsolete as a remedy for these obstructions.

We, as urologists, are ready to substitute a simple, safe and effectual remedy for the relief of these symptoms of prostatism. The one important requirement is to get the patient early, before his gland has attained an enormous size and his general physical condition has become damaged beyond repair. This puts the responsibility up to the profession as a whole. With you, internists and general practitioners, who see these patients first, rests the responsibility of recognizing the symptoms early and advising your patients correctly and intelligently.

I do not wish to convey the impression that every man presenting symptoms of vesical irritability should be recommended for operation. I do contend that all patients with obstructive symptoms should be given the benefit of an intelligent urological examination and then be advised as to the necessary treatment as determined by that examination. The patient is entitled to this information and eventually will obtain it. My plea is this: Give your patient the necessary examination early, and by so doing give him the benefit of any preventive treatment necessary to ward off the impending danger.

PROSTATIC RESECTION

Avoidance of these dangers lies in the modern procedure known as resection. By this method the obstructing portion of the prostate gland is removed, piece by piece, and under direct vision, with instruments passed through the urethra. This allows for the free passage of urine, with complete emptying of the bladder and the consequent relief of symptoms of prostatism.

Resection is more rational in its inception, more scientific and precise in its application, and withal a more delicate and aseptic operation than suprapubic prostatectomy.

This idea of removing obstructive tissue from the vesical neck by instrumentation is by no means a new one. Nearly 100 years ago (1841) Mercier designed the first instrument for this purpose. During the intervening years repeated attempts have been made by ingenious urologists to devise a practical instrument for this purpose. Time will not now permit a discussion of the many instruments devised during the past 100 years. Suffice it to say that none of these have fulfilled the exacting demands of urologists to the extent of obtaining popular acceptance. The recent work of Young, Caulk, Foley and many others is noteworthy, but it remained for Davis to prove the feasibility of the procedure with the Stern Resectoscope which he has modified and improved until we have a simple and practicable instrument for this work. Another handicap for successful resection in the past has been the available electrical equipment. It is during the past two years only that electrical engineers have provided an adequate electrosurgical unit to perform this type of surgery. To do satisfactory resection the urologist must have: (1) An instrument with which he can remove the desired amount of tissue quickly and easily and under direct vision with an adequate lighting system, and (2) an electrosurgical unit with adequate cutting and coagulating currents at his instantaneous command.

The admirable work of Davis during the past five years has attracted national attention. This, with the advertising of the procedure by instrument makers and electrical houses, has given resection a rapid popularity hardly equaled by any surgical procedure in the past. Favorable discussion, among the profession and laity alike, has reached the point where the older doctor no longer lives in fear of prostatic obstruction, the younger doctor looks forward with pleasant anticipation to his old age, and the layman comes to the urologist asking for the new operation.

What, you may ask, have we to offer the patient who seeks relief early in the course of his disease? This can best be answered by citing a few typical cases.

D. W., aged 77 years, was referred on May 20, 1932, on account of complete retention of 6 days' duration. There had been increasing frequency of urination. Examination revealed a small, thin, wiry man, apparently in good general condition for his years. Seven ounces of turbid urine were obtained by catheter. This showed massive staphylococcus infection. Rectal examination showed a prominent, enlarged, elastic prostate, the left lobe being the larger of the two. As he had been catheterized intermittently for 6 days, he was placed at once on permanent drainage by indwelling catheter. Later, cystoscopy showed a prominent bar posteriorly and bilateral intra-urethral lobes. Resection was carried out on May 25, 7 grams of tissue being removed from the median bar and lateral urethral lobes. The patient experienced no bad effects with the operation or afterwards. He sat up in bed during the afternoon of the day of operation, ate his regular supper and was up and walking around the following day. There was no fever. His catheter was removed on the second day and he went home on the third day. He has had no further trouble. He reported to the office 6 months later to say that he felt better than he had felt for years. His friends tell him he looks 20 years younger. He empties his bladder completely.

B. J., aged 53 years, was referred on May 1, 1932, on account of complete retention of about 6 months' duration. He had been examined elsewhere and his condition was deemed unsafe for operation. At that time his blood creatinin was above 7 mgm. per 100 cc. of blood. He had worn an indwelling catheter for the past 6 months and was unable to pass any urine except through the catheter. The prostate felt per rectum not enlarged, and was smooth and firm. Cystoscopy revealed a median bar, but no enlargement of the lateral lobes. The kidney function as determined by blood chemistry was poor: N. P. N. 65 mgm. per 100 cc. of blood, creatinin 2.4 mgm. per 100 cc. of blood. Having no hope of improving his general condition we proceeded at once with the resection. Five grams of tissue were removed. A retention catheter was placed in the urethra for 2 days and the patient voided when it was removed. He was up and about the ward every day and had no difficulty in voiding. He was ready to leave the hospital 4 days after operation. One month later he was completely emptying his bladder.

I could cite many similar results from the 46 cases we* have treated by resection during the past year. Suffice it to say that the results in these cases are typical of the results we may reasonably expect to obtain when resection is carefully and intelligently applied to a favorable type of case, namely, the small or medium sized gland.

Advantages of Resection

It has been said that resection is unnecessary since we have a standardized operation with a low mortality and giving favorable results. I contend that prostatic resection is the most outstanding advancement for the relief of suffering humanity that urology has yet to offer. In substantiation of this statement I would offer the following:

I. Resection offers a comparatively simple, safe and relatively minor procedure for the relief of patients with a small prostate. I think all urologists are ready to admit this. It is certainly easier to do than any of the so-called punch operations, and the large number of cases reported in the literature during the past year indicates its wide popularity.

II. Resection offers a successful means for the prevention of impending prostatism that is readily accepted by patients. Prostatic disease carries a high mortality, at present something like 25 per cent. These are not all operative deaths. Most of these patients die of uremia before the urologist can get them in shape for operation.

The magnitude and severity of prostatectomy has prevented us often from recommending it except as a last resort. The two-stage operation entails weeks and often months in the hospital, with drainage either in a bottle or in the bed, suffering, disagreeable odors, fever and infections, not to mention the expense of room, nurses and necessary dressings and medicines. Compare this picture with that of a favorable case of resection. The patient is examined and receives all his preliminary treatment in the office. Functional tests are carried out there, and the patient continues with his usual work, providing he has a position. I have not time to go into the details of this preliminary treatment except to say that I consider it just as essential as for prostatectomy, the important difference being that it is carried out in the office and the patient is kept at work. On the day set for resection the patient eats a light breakfast at home and enters the hospital between 9 and 10 o'clock in the morning. Resection is carried out the same day under transsacral anesthesia. A retention catheter is placed in the urethra and the patient is kept in bed the remainder of the day. Fluids are continued and the patient eats a regular supper. Normally, there should be no pain or discomfort. There is rarely any appreciable fever, and the patient is expected to be out of bed and about the ward the day after operation. The catheter is removed in from 1 to 3 days and the patient goes home the following day. Our last 14 patients have stayed in the hospital for a total of 107 days, an average of 7½ days for each.

III. Resection can be employed to relieve obstruction in cases in which a major surgical procedure is prohibitive on account of the general condition of the patient. The simplicity of the procedure and the lack of shock produced by it makes it possible to employ it with comparative safety in cases of very debilitated patients. We have, during the past year, successfully resected cases suffering with advanced cardiorenal disease, hypertension, asthma, inoperable carcinoma of the bladder with retention, uremia, large ventral hernia and paranoia. There were 8 cases in which open operation would have entailed grave danger and in some cases could not be attempted at all. All of these patients have regained normal urinary function with resulting improvement in their general health. Most of these men had complete retention, and their restoration to any semblance of comfortable living is, to my mind, little short of miraculous.

---

* "We" refers to Drs. H. A. Fowler and the author.

IV. Resection is the safest and most efficient means of relieving obstructoin due to carcinoma. We can offer no hope of cure for a man with advanced cancer of the prostate. These patients come in on account of bleeding, intolerable frequency, painful urination and often with complete obstruction. Resection by itself or in connection with radium or X-ray therapy offers more relief than any other method. We have treated 6 patients with carcinoma in the past year. Each was relieved symptomatically by one resection. Three have since died of metastasis. Two are living and have had no urinary troubles up to the present; the other developed symptoms of frequency with retention and a second resection was done 9 months after the first. He has extensive osseous metastases.

Requisites

Resection is a simple procedure for the patient. This is undoubtedly true when the resection is properly performed. To make a resection simple for the patient is not an easy task, indeed it is one of the most painstaking and exacting operations we have to perform. Before undertaking resection, one must know the physiology of micturition, how and why it is interfered with, and how to obtain relief from this interference. One must be a urologic surgeon, as well as an expert instrumenteur, and he must be prepared to master and carry out a multitude of exacting details before, during and after resection. One must know something of electricity. Above all, he must possess great patience. I know of no one doing this work who has had an easy time. There are many complications and pitfalls which can be avoided only by the utmost care and close application to a most exacting technic. I believe we have had a taste of about every complication that can come to anyone doing this work.

Results

We have had 2 deaths following resection, 1 due to hemorrhage and shock, the other to cerebral embolus. There was 1 case of severe epididymitis in a patient who did not void following resection. The condition subsided in due time, and a second resection was entirely successful. There was 1 case of severe pyelonephritis with septic fever and prostration for several weeks. He ultimately made a complete recovery. One patient still retains about 120 cc. of residual urine. He has no symptoms and is otherwise normal. One patient developed a stricture as a result of over-distention of the urethra. He has been treated by dilatation. Two patients still have a little dribbling at certain times and under certain conditions. The fact that neither patient dribbles continually seems proof that the external sphincter is not injured and that control will ultimately be complete. I think all other cases void without difficulty and have no residual urine. Some of these complications have come as a result of inexperience, and some have undoubtedly been the result of attempting resection in unfavorable cases. We have not considered any case too difficult for resection and have attempted some that were considered by other surgeons amenable only to major operative procedures. Strange as it may seem, our ultimate results have been uniformly good in these difficult cases, although a few of the larger glands required a second resection to effect a complete cure.

During the past twelve months, ending March 1, we have had under our care 67 patients with prostatic obstruction. Seven died under preliminary treatment before any operation was done, 1 of heart disease, 2 of multiple kidney abscesses and 4 of uremia. Three prostatectomies have been done. Twelve patients have thus far deferred any radical treatment. The remaining 46 cases, or 93 per cent of the total, were treated by resection. Our second patient had resection 3 times. Six patients had resection twice; the remaining 39 had 1 resection each. These cases are in no way selected, but rather are representative of the usual types of cases coming to urologists connected with a general hospital and doing private work. Some of these cases were ideal for resection; others were believed to be suitable only for surgical operation.

Our conclusions, based on the end results in these 46 cases, impress us with the efficacy of resection in practically all types of prostatic obstructions and absolutely convince us that prostatectomy is unnecessary in any except the enormously enlarged glands. I predict that these large glands are destined to become a curiosity in the future, and likewise the operation of prostatectomy.

Time will not permit a free discussion of the technic for this work. As this is a comparatively new procedure, we have had to work out our own salvation. We have followed all our cases very carefully and believe we have learned some definite things about the proper management of these conditions. We are treating these cases quite differently now from the way we did at first, in fact, we have evolved a technic for the preparation and postoperative care of these cases which we have applied during the past 3 months, with results that seem to satisfy the most exacting criticism. I shall mention what we believe to be the 5 cardinal requirements for successful prostatic resection which have evolved from our year's work and study:

1. Proper and adequate preliminary treatment.
2. Proper control of hemorrhage at operation.
3. The exercise of adequate care and skill in transurethral manipulation.
4. The removal of the proper amount of tissue, from the proper place.
5. Constant and intelligent postoperative care.

CONCLUSIONS

1. Prostatic resection is the most rational method at hand for the treatment of prostatism.

2. It should be the method of choice for the relief of all patients with small or medium-sized glands.

3. It should be applied as a preventive measure for the relief of symptoms in patients with beginning hypertrophy.

4. It can be applied to debilitated patients for whom prostatectomy is prohibitive.

5. Because of the short stay in hospital, lack of discomfort and danger, prompt restoration to health and moderate expense, patients readily accept this operation.

6. It is the only rational method of relief of obstruction due to carcinoma of the prostate.

When these facts become more generally known, it is hoped the general practitioner will send his patient to the urologist for relief before his kidneys, heart and blood vessels have been severely damaged as a result of the obstruction. When such a patient comes to a skillfully trained urologist today, he can be assured of relief from his symptoms by this relatively minor operation, with a complete and rapid convalescence, with a minimum of danger, with complete absence of the many disagreeable features connected with prostatectomy, at a great saving in expense.

BIBLIOGRAPHY

CAULK, J. R.: Obstructive Lesions of the Prostate. J. A. M. A., 1930, **94**, 375.

CAULK, J. R.: The Instrumental Treatment of Prostatism. J. Urol., 1931, **26**, 49.

DAVIS, T. M.: Davis Method of Prostatic Resection. South. Surgeon, 1932, **1**, 97.

DAVIS, T. M.: Present Status of Prostatic Resection. J. A. M. A., 1932, **99**, 1928.

FOLEY, F. E. B.: Cystoscopic Prostatectomy; Further Report. Minnesota Med., 1932, **15**, 567.

MERCIER, L. A.: Recherches anatomiques, pathologiques et thérapeutiques sur les maladies des organes urinaires et genitaux. Paris, Béchet jiune & Labé, 1841.

YOUNG, H. H.: A New Procedure (Punch Operation) for Small Prostatic Bars and Contracture of the Prostatic Orifice. J. A. M. A., 1913, **60**, 265.

DISCUSSION

Dr. H. A. Fowler: I have been associated with Dr. Dorman in his work of resection during the past year, having had the opportunity of examining almost every case before operation, watching the operative technic, and following closely the after care. One easily detects a note of enthusiasm in Dr. Dorman's discussion of his personal experience. After watching his work and following his results, I have come to share his enthusiasm. In order to emphasize the ease with which these patients can be relieved and to make the contrast more striking, he has somewhat overdrawn the picture of prostatectomy. This operation is in fact one of the most brilliant achievements in urology. I am in agreement with Dr. Dorman, however, that prostatectomy is unnecessary in certain cases if we have an operation that will assure the same good results with less effort, greater comfort to the patient and at less expense. In this small series of cases Dr. Dorman has shown that satisfactory functional results are obtained by resection with less danger to the patient, with a shorter sojourn in the hospital, and at a hospital expense incomparably less than for an ordinary prostatectomy. I believe there has always existed among urologists the feeling that for the treatment of those minor obstructions an open, cutting operation has really been a bit too much of an operation. It has been felt there should be some means devised for obtaining relief short of prostatectomy. Resection represents the latest development for that purpose. It has been found that resection can also be used successfully in cases with definite hypertrophy of the prostate. It seems to me Dr. Dorman has proved that fact. During the past year we have done only 2 or 3 prostatectomies. In performing resection, Dr. Dorman has devised a technic which throws every safeguard around the procedure. Resection is not a simple operation. Anyone who does not seriously undertake the mastery of all the necessary details of this operation, particularly the pre- and postoperative care before attempting it, is riding for a fall, because there are many pitfalls along the way. It is only by the most careful study and preparation that one can hope to obtain satisfactory results.

Dr. Francis R. Hagner: I congratulate Dr. Dorman on the work he has done. I have not done as many resections as Dr. Dorman. There have been no deaths in my series. Some men have had a higher mortality in resection than in prostatectomy, however. I agree with Dr. Dorman that in a small prostate with a short urethra this operation is certainly indicated. Some of my patients that had no residual urine after the operation are beginning to have a gradually increasing retention. It may be that I did not remove enough prostatic tissue at the operation, but did remove enough to relieve the obstruction at that time, and that the obstruction is now returning. I do not believe we can say that with patients who have a small amount of residual urine with frequency resection is going to prevent them from developing prostatism later. Time has not elapsed long enough to make this statement.

Dr. Dorman (In closing): I want to thank the gentlemen for their generous and kindly discussion. The question of the permanency of resection has been raised, and it has been referred to as a temporary procedure. Resection is not a temporary operation. I have chosen to give you the facts and figures from my own experience of one year's work, and obviously cannot say how long these men are going to stay well. The reports from urologists who have done resection over a period of years are favorable. It is possible that some of my cases may need another resection later. I do not hesitate to recommend a two-stage prostatectomy, and occasionally one of these cases has to have another operation. The point I wish to make is that the time in hospital, suffering and expense incurred by resection is so slight as compared with a two-stage prostatectomy that the patient does not object to a second resection if the results of the first are not entirely satisfactory. Dr. Fowler has stated the mortality figures in prostatectomy correctly at 5 per cent or less, in the hands of our leading urologists. Possibly I did not make myself clear on this point. I said the mortality in prostatic disease runs between 20 and 25 per cent, this difference being due to the fact that many cases suffering with prostatic disease die under preliminary treatment. If the patient survives preoperative treatment he has a 95 per cent chance of getting well. It is with the idea of materially reducing this remaining 20 per cent mortality that I recommend resection as a preventive measure and solicit the coöperation of the profession in examining these men and referring them for treatment before it is too late. There is abundant opportunity to reduce the mortality in prostatic disease.

MAMMOTH INOPERABLE SCROTAL HERNIA*

Report of a Case

James A. Cahill, Jr., M.D.
Professor of Clinical Surgery, Georgetown University School of Medicine

One of the most common surgical lesions is a hernia. It is the protrusion of any viscus through the walls which normally confine it. More than 12 per cent of all individuals suffer from some variety of hernia. By far the most common situation is in the inguinal region of the abdominal wall when the peritoneum pushes forward as a protruding sac. The hernial sac has been found to contain almost any and all of the abdominal viscera. Inguinal hernias vary in size from a very slight bulging to one of such enormous proportions as that pictured in the present case report. These hernias are divided clinically into reducible, irreducible, incarcerated and strangulated. To cure any variety requires operation, and the incarcerated and strangulated types demand immediate relief. There is, however, occasionally a very large, irreducible hernia of such proportions that operation cannot be performed with safety. This is due to several facts. First, the hernial opening may be so large that much of the intestines and other abdominal viscera have escaped into the sac and reduction is impossible. Second, restoration of the normal position of the abdominal viscera may be impossible because forcible handling produces much shock. Third, restoration may also be impossible because the abdominal cavity has contracted and can not hold or can retain only with great difficulty the contents of the huge hernia; quoting from Da Costa, "The hernia has forfeited the right to domicile."

---

* Read at the Semi-Annual Meeting of the Maryland, Virginia and District of Columbia Medical Society, November 23, 1932.

Most hernias are reducible, but some are irreducible and require immediate operation. The success of an operation for the radical cure of the hernia depends upon the attainment of primary union. This union occurs when one has approximated like structures, namely, the suturing of fascia to fascia and muscle to muscle without the interposition of fat or other dissimilar tissue. Infection, of course, interferes with primary healing. There is, however, much stress on the newly repaired abdominal wall. Therefore, a mammoth hernia is not amenable to successful repair, since the contents of the sac can not be retained within the abdominal cavity for a sufficient length of time to permit primary union.

REPORT OF CASE

The patient, a negro aged 48 years, was seen in July, 1932. His family and previous histories were negative. His present illness started in 1899 when he lifted a heavy barrel of molasses weighing about 700 pounds. Following this strain, he noticed a protrusion in the right inguinal region which gradually became larger until a very large hernia had formed. It caused him considerable discomfort and pain, and in May, 1925, he was operated upon. Shortly after the operation, the large hernia recurred. This time it was somewhat bigger than before. He was again operated upon at the same hospital, but, the hernial mass again recurred. He went to another hospital and underwent 2 more operations, suffering recurrences after each operation because it was impossible for the large hernia to be retained within the abdominal cavity. Since his last operation in 1926 the hernial mass has grown larger and now protrudes as a huge mass, dropping between the thighs and extending below the knees. He complains of marked dyspnea, is able to get about only with great difficulty and is unable to pursue any occupation. He complains of heavy, dragging pains throughout the lower abdomen and the hernial mass. His bowels move normally and there are no urinary symptoms. There has not been evidence of obstruction. He has some digestive disturbances. Physical examination shows a very large, "heavy-set" negro, weighing 250 pounds. His heart is somewhat enlarged. The abdomen is very large and pendulous. The hernial mass shown in the photograph (Fig. 1) has its origin in the right inguinal region. The greatest circumference is 40 inches and the diameter 15 inches. The circumference at the neck of the sac is 28 inches. It is irreducible and inoperable. The skin is markedly thickened and indurated and of a leathery character. There is some edema present. The penis is retracted and incorporated into the hernial wall. There is a small meatal opening about 4 inches below the pubis through which the urine passes. There is some incontinence. Transillumination is negative. Upon palpation, the mass is very firm and there is no impulse upon coughing. The mass is not tender although in walking some discomfort and occasional pain are present. He supports the entire mass with a sling suspended from his shoulders when he desires to get about.

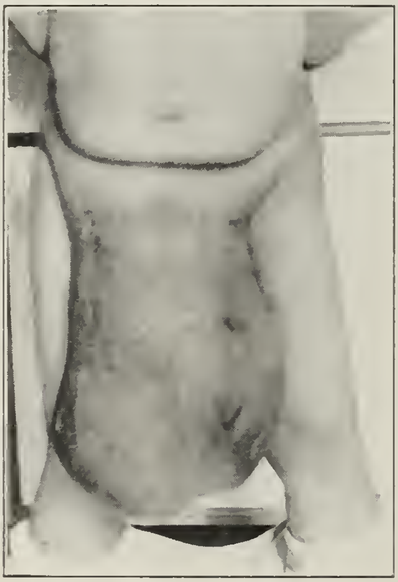


FIG. 1. MAMMOTH INGUINAL HERNIA

SUMMARY

1. This hernia is worthy of report owing to its mammoth size. It is one of the largest on record.

2. It proves the fact that a radical cure is impossible and that operation should not be attempted.

3. It also emphasizes how a patient with such a deformity can still carry on to some extent with comparatively little discomfort.

Science Series. No. 13

ACID-BASE EQUILIBRIUM

CHARLES A. SCHUTZ, M.D.

Assistant Professor of Pediatrics, George Washington University School of Medicine

The researches of Henderson (1, 2) in 1920 and 1921 first gave a clear idea of the nature of acid-base metabolism in the animal body, and since that time an immense amount of work has been done in this field, notably by Van Slyke (3, 4), Gamble (5, 6), Peters (7), Marriott (8, 9), Hartmann (10, 11, 12, 13), and their associates. The knowledge thus gained, however, has remained largely unavailable to the general medical worker, through his necessarily limited acquaintance with chemical and mathematical terms. As Gamble (6) so aptly states, "the results of this type of research ought to be translatable into plain English."

Before attempting a résumé of this work, it will be necessary to examine some of the underlying principles involved. Under ordinary conditions the body maintains itself in a state of almost exact equilibrium with respect to the hydrogen-ion and electrolyte concentration of its fluid content, this equilibrium being maintained in spite of the fact that such acids as carbonic, lactic, phosphoric, and sulphuric are constantly being formed and eliminated. To simply explain the term hydrogen-ion concentration, it may be stated that a solution is acid, neutral, or alkaline, depending on its relative concentration of hydrogen-ions or hydroxyl-ions (H^+ or $\overline{OH}$). For example, pure distilled water contains $\frac{1}{10,000,000}$ or 10^{-7} grams of hydrogen-ion per liter. Hydrogen-ion concentration is usually expressed by the symbol pH, which is the negative logarithm of the hydrogen-ion concentration. The expression pH 7.0, therefore, represents a hydrogen-ion concentration of 10^{-7}, and is considered as the neutral point.

In health, the blood is held at a value of pH 7.35–7.45. Some idea of the narrow range of this reaction may be realized if one considers that death of the body results if the blood shifts for any length of time to the acid reaction represented by the pH of distilled water, or, on the other hand, to the alkaline reaction of tap water.

Of the acids mentioned, carbonic acid is the only one found to circulate as such in the body. The others, i.e., phosphoric, lactic, and sulphuric acids, until excreted, must be almost entirely neutralized by base, composed of sodium, calcium, potassium and magnesium. Of these bases, sodium plays by far the larger part in maintaining an equilibrium.

A clearer idea of the mechanism by which this equilibrium is maintained may be had by studying the accompanying schematic diagram, similar to that first devised by Gamble (6).

The body maintains three important defensive mechanisms to prevent dangerous shifts in either an acid or alkaline direction. These are, as classified by Hartmann (13):

1. Buffer Action: By buffer action is meant the protection of a solution against marked change in hydrogen-ion concentration upon the addition of strong acids or alkalies. For example, if a few drops of an indicator, say phenolphthalein, are added to some distilled water, the reaction of this water will shift to alkaline (red), upon the addition of one drop of dilute sodium hydroxide, and back again to white (acid), if an equivalent amount of hydrochloric acid is added. If, instead of distilled water, we use a solution of bicarbonate, a great deal more alkali or acid will be needed to cause a corresponding shift. In other words, the solution is "buffered."

The reaction of the body fluids is largely determined by the relative amounts of free carbonic acid, and of its alkaline salt carbonate, which they contain, since these are the only free acid and alkali existing as such in the body. These buffering actions may be illustrated as follows:

$$NaHCO_3 + HCl = NaCl + H_2CO_3 \tag{1}$$

$$H_2CO_3 + NaOH = NaHCO_3 + H_2O \tag{2}$$

Protein also has the ability to act as a buffer substance, its action being especially marked in the red blood cells and body tissue cells, and to a lesser extent in the blood plasma and lymph.

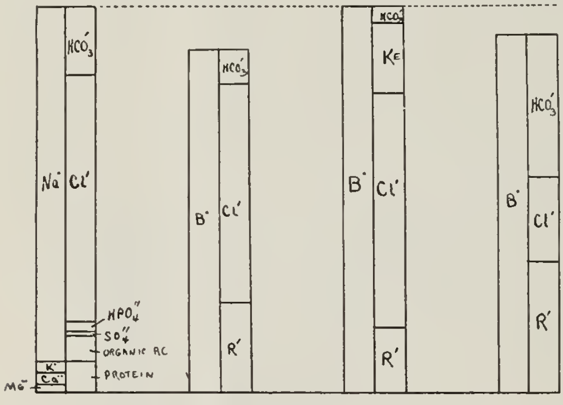
2. Respiratory Activity: Carbon dioxide is constantly being eliminated by way of the lungs, and an equivalent amount of carbonic acid (which is simply carbon dioxide dissolved in water) is being lost to the body. Hence, when there is a tendency to shift to the acid side, acceleration of respiration, by increasing the rate of elimination of carbonic acid, will tend to maintain an equilibrium, and conversely, decreased respiration will tend to conserve carbonic acid when the tendency is to a shift to the alkaline side.

3. Kidney Function: The kidney is capable of secreting urine as acid as pH 5.0, and as alkaline as pH 8.0. When it is considered that a shift of this magnitude in the body fluids would mean almost instant death, the importance of renal activity in preserving the acid-base equilibrium becomes immediately evident.

For example, phosphoric acid may exist in the blood as Na_2HPO_4 (sodium alkaline phosphate), and, by reaction with carbonic acid, leave the kidney as NaH_2PO_4 (sodium acid phosphate), as illustrated by the equation

$$Na_2HPO_4 + H_2CO_3 = NaHCO_3 + NaH_2PO_4$$

Also, in very acid urine, a large proportion of organic acids, such as the ketones formed in severe diabetes, may be excreted unneutralized.



No. 1. Normal. Showing Relative Amounts of Electrolyte in Blood Plasma

No. 2. Diarrheal Acidosis. Reduction of Base Due to Rapid Elimination of Basic Intestinal Juices. Striking Reduction of Bicarbonate

No. 3. Diabetic Acidosis. Marked Replacement of Bicarbonate by Acetone Body Acids (Ke)

No. 4. Alkalosis Following Pyloric Stenosis. Reduction of Cl Due to Vomiting, and Corresponding Increase in Bicarbonate

Diagram as devised by Gamble (see text). In columns 2, 3, and 4, total base is represented by $B^{\cdot}$, and smaller acid factors by R'.

A further function of the kidney is to manufacture ammonia (NH_4) from urea, a neutral substance. This ammonia may combine, for example, with chlorine to form ammonium chloride which is excreted in the urine, leaving sodium ion to reënter the blood and thus preserve the supply of base.

From the foregoing, it will be evident that a condition of disturbed acid-base equilibrium in the body may be brought about in a number of ways. Before taking up these factors in detail, it may be well to repeat that upon the bicarbonate ion (HCO_3) falls the chief duty of maintaining an exact acid-base equivalence of the basic ions and acid radicals of the body fluids. It has therefore been termed the mobile reserve of acid-base equilibrium.

A tendency to acidosis, then, may be produced by an increase of carbonic acid due to depressed breathing from any cause, or to a decrease of base-bicarbonate resulting from the displacement of HCO_3 (bicarbonate radical) by other anions, e.g., lactate, chloride, fatty acid, etc. Also, base-bicarbonate may be lost from the body by way of the digestive or urinary tract. Conversely, a shift to the alkaline side may be caused by hyperventilation, thus decreasing carbonic acid, or by an increase of base-bicarbonate due to accumulation of administered alkali. In addition, carbonic acid may replace other anions. For example, in severe vomiting, a large amount of Cl ion may be lost by way of the gastric juice, and its place taken by HCO_3. The above reactions are illustrated in columns 2, 3, and 4 of the diagram.

An accurate diagnosis of disturbance in acid-base equilibrium is often exceedingly difficult without laboratory analysis of one or more constituents of the blood. Clinically, the character of respiration is the most important clue to such disturbance. It will be evident from the foregoing discussion, that when acidosis exists, an effort will be made by the body to excrete carbonic acid more rapidly from the lungs. This effort results in the deep, pauseless, somewhat rapid Kussmaul type of breathing, the so-called "air-hunger." On the other hand, when alkalosis impends, the breathing will be slow, quiet, and shallow, with periods of apnoea, in order that carbonic acid may be preserved in the body fluids. From the laboratory standpoint, a determination of the CO_2 combining power of the blood plasma provides the most important single clue to the state of the body fluids. Bear in mind once again that carbonic acid is simply CO_2

dissolved in water, so that the ability of the blood to combine with CO_2 is really an expression of its ability to combine with acid. Hence, the more acid the blood, the less will be its ability to take up CO_2, and vice versa. Under normal conditions, the blood plasma will combine with an average of 55 volumes per cent of CO_2. In acidosis, this value may decrease to 15 or lower, and in alkalosis, the figure may increase to 100 or over, these values, in infancy, representing about the extreme ranges compatible with life. In addition, it is desirable to determine other constituents, for example, the chloride or lactic acid content.

The present paper will be limited to a discussion of the characteristic findings in three well-defined types of acid-base disturbance: (1) Acidosis in infants resulting from infection, vomiting, watery diarrhea, and dehydration; (2) diabetic acidosis with coma; and (3) pyloric stenosis complicated by alkalosis and tetany.

In acidosis due to diarrhea, the clinical picture is usually as follows: The infant is found to have some focus of infection, either in the intestinal tract itself, or in the throat, ears, or mastoid antrum. Unless extremely prostrated, irregular fever is present. Vomiting of greater or less severity occurs, and from 8 to 20 copious watery stools are passed daily. Urinary output is greatly reduced. There is increasing restlessness, and the infant becomes rapidly dehydrated, with dusky gray color of the skin. Presently, the characteristic "air-hunger" type of respiration is noted, and the infant may rapidly become comatose.

The blood picture in this condition approaches that shown in column No. 2. From this diagram, it will be seen that the amount of base has been substantially reduced, due to the rapid elimination of basic intestinal juices. The chloride ion is usually slightly reduced, due to loss of gastric juice by vomiting, although the amount of HCl secreted by the gastric mucosa often decreases in proportion to the severity of the infection. The most marked change, however, is the striking reduction of bicarbonate, as determined by the CO_2 combining power of the blood plasma. Lastly, there is usually a considerable increase in lactic acid ion, due to the dehydration and resulting anoxemia from circulatory embarassment.

Diabetic acidosis with coma rarely occurs in young infants. The clinial picture is essentially that of any severe acidosis. The attack is usually precipitated by a focus of infection, often a simple pharyngitis. There is rapidly increasing malaise, the subject becomes increasingly drowzy, and soon enters a stage of frank coma, with again the characteristic hyperpnea or "air-hunger." A frequent finding in these cases is the presence of moist râles at the base of one or both sides of the chest. The white count is frequently elevated, so that pneumonia is often suspected. The presence of a fruity odor to the breath helps to confirm the diagnosis of diabetes.

The blood picture is essentially that shown in column 3 of the diagram. Here, it may be seen that the HCO_3 ion has been largely displaced by acetone body ions (represented by the symbol Ke), the CO_2 combining power of the plasma often being reduced to 15 or lower from a normal of 55 volumes per cent. Examinations of the urine and blood for sugar show, of course, the usual changes which are all familiar.

In the third condition to be described, alkalosis and tetany complicating pyloric stenosis, the clinical and blood pictures are somewhat reversed. Vomiting of increasing severity occurs, but constipation is the rule, due to the failure of food to pass into the intestinal tract. For the same reason, progressive wasting takes place, accompanied by anemia of increasing proportions. If the condition progresses, the respirations may become slow and shallow, often with prolonged periods of apnea, i.e., the organism endeavors to preserve carbonic acid (H_2CO_3) in the body fluids by slowing respiratory activity. Finally, if the infant develops spasmodic muscular contractions, and the hands and feet assume the characteristic attitude of so-called "carpopedal spasm," the picture of tetany is complete.

The blood findings are shown in column 4 of the diagram. Here one may note a marked reduction in chloride ion, due to loss of this ion in the vomitus. A corresponding increase in bicarbonate occurs, together with a moderate increase in other acid ions.

With the foregoing conception of acid-base disturbance in mind, treatment should be directed toward removing as far as possible the abnormal conditions found. Replacement of fluid is of prime importance in every case, since by so doing the circulation is improved, and excess acid or basic ion more readily disposed of. Because of vomiting, it is usually not practicable to restore body fluid by oral administration. Large amounts of fluid can be administered, however, by subcutaneous, intraperitoneal, or intravenous injection of isotonic glucose (approximately 6 per cent), normal salt solution, or Ringer's solution. If oliguria is present, this condition may often be relieved by intravenous injection of hypertonic glucose (10 per cent to 20 per cent). Restoration of kidney function is of utmost importance, and, as Hartmann (11) has shown, when oliguria persists, administration of salt solution in acidosis may increase the acidosis due to retention of chlorine ion and further driving out of HCO_3. In extreme cases of acidosis, actual temporary replacement of base-bicarbonate may be resorted to, until respiratory and renal activity have had time to bring about adjustment. Base-bicarbonate may be administered, after suitable preparation, as 5 per cent sodium bicarbonate in amounts calculated to partially or completely restore the balance of this substance.

In alkalosis with tetany, the first consideration is the relief of the convulsions, since death may quickly supervene when this condition is present. This may be rapidly and conveniently accomplished by the intravenous injection of calcium chloride (0.5 cc. of 5 per cent solution per kilo of body weight), or calcium gluconate (1.0 cc. of 10 per cent solution per kilo) intramuscularly. Renal function should be reëstablished by abundant fluid administration, in order that excess base-bicarbonate may be eliminated. Since, in this condition, the chlorides are greatly reduced, administration of salt solution will usually accomplish both restoration of chlorine ion and at the same time bring about a diuresis and consequent elimination of excess base-bicarbonate.

Recently, Hartmann (13) has devised a "combined solution," composed of sodium lactate, sodium chloride, potassium chloride and calcium chloride, which, when properly diluted, may be injected by any route for the relief of dehydration. This solution is designed to supply chlorine ion as needed, the potassium and calcium are balanced, and the sodium lactate is slowly converted to sodium bicarbonate to be used or excreted as the case may be. Because of its diuretic effect, this solution may also be safely used in alkalosis, unless there is actual kidney damage preventing excretion of accumulated base-bicarbonate.

It should be borne in mind that in addition to the above more or less temporary measures, an effort should be made to remove the underlying cause of the disturbance. In the case of diarrheal acidosis, treatment should be directed toward eliminating the focus of infection; in diabetic acidosis, glucose and insulin should be administered to check the formation of and burn the acids of incomplete fat combustion; and in pyloric stenosis with alkalosis, operative interference should be instituted at the earliest possible moment after suitable preparation of the infant.

Illustrative Cases

Case 1: A white male infant, aged 11 months, was admitted to Children's Hospital, April 25, 1932. Admission weight was 18 pounds. The temperature was 101.5°F. History of vomiting and watery diarrhea (24 stools) for 2 days prior to admission was given. Examination disclosed acute pharyngitis, tonsillitis and catarrhal otitis media. On April 26, respirations became deep and labored, and the CO_2 combining power of the blood plasma was found to be 22 volumes per cent. Hartmann's solution and glucose solution were repeatedly administered, and the infant showed rapid improvement. Within 24 hours, the CO_2 combining power had risen to 37 volumes per cent. The stools became normal in number and appearance, and the infant was discharged, May 7, weighing 18½ pounds.

Case 2: (Presented through the courtesy of Drs. James M. Moser and Maurice A. Selinger). A white female child, aged 6 years, was admitted to Children's Hospital, March 13,

1932. There had been slight malaise for 3 weeks and mild upper respiratory infection for several days prior to admission. The child seemed fairly well on retiring, March 12, but on the morning of March 13 seemed to breathe with great difficulty. Entrance examination disclosed a semi-stuporous child, with ashen skin and deep, labored respirations. A few sticky râles over the left base and both anterior bases of lungs were present. The temperature was 98.6°F. A roentgenogram of the chest showed the lungs to be clear. The urine contained sugar. The blood sugar on admission was 465 milligrams per 100 cc. Insulin and glucose were administered, and the following day, March 14, the blood contained 220 milligrams sugar per 100 cc. with CO_2 combining power of 15 volumes per cent. Hartmann's solution was administered repeatedly, in conjunction with insulin, glucose and orange juice and rice water by mouth. Gradual improvement resulted. On March 17, the CO_2 combining power had risen to 32 volumes per cent. The child was discharged on March 26, 1932, after insulin and dietary requirements had been determined.

It is of interest in this case, that in spite of adjustment of the blood sugar by insulin and glucose the child remained in a precarious condition of coma for 2 days, the later repeated administration of Hartmann's solution apparently being a decisive factor in the child's recovery.

Case 3: A white female infant, aged 2 months, was admitted to Children's Hospital, September 26, 1930. It was breast-fed until 1 week prior to admission. History of continuous projectile vomiting, beginning shortly after birth, with increasing constipation and failure to gain was given. Birth weight was 8 pounds, 4 ounces. Weight on admission was the same. Entrance examination revealed a dehydrated infant with depressed fontanelle in a toxic, stuporous state. Apneic pauses in respiration were observed. The admission temperature was 102°F. The infant was given a blood transfusion and repeated injections of normal saline. Pyloroplasty was performed, September 29, 1930. October 2, convulsions began, shortly followed by marked carpopedal spasm. The convulsions and spasm were relieved by administration of calcium gluconate intramuscularly, followed by $CaCl_2$ by mouth, supplemented later when the temperature became lower by exposure to ultraviolet light. A low grade pyelitis persisted for several weeks, and considerable edema was noted at times. Repeated blood transfusions were given, and other fluids (glucose and saline) administered as needed. The infant finally made a good recovery, and was discharged from the hospital, November 30, 1930, weighing 9 pounds, 3 ounces. When seen in the Child Welfare Clinic 15 months of age, the infant weighed 22 pounds, 8 ounces, and was in robust health.

BIBLIOGRAPHY

1. Henderson, L. J.: The Equilibrium Between Oxygen and Carbonic Acid in Blood. J. Biol. Chem., 1920, **41,** 401.
2. Henderson, L. J.: Blood as a Physico-chemical System. J. Biol. Chem., 1921, **46,** 411.
3. Austin, J. H., and Van Slyke, D. D.: The Determination of Chlorides in Blood Plasma. J. Biol. Chem., 1921, **45,** 461.
4. Van Slyke, D. D., Wu, H., and McLean, F. C.: Studies of Gas and Electrolyte Equilibrium in the Blood. V. Factors Controlling the Electrolyte and Water Distribution in the Blood. J. Biol. Chem., 1923, **56,** 765.
5. Gamble, J. L., Ross, G. S., and Tisdall, F. F.: The Metabolism of Fixed Base During Fasting. J. Biol. Chem., 1923, **57,** 633.
6. Gamble, J. L.: Acidosis and Alkalosis. New England J. Med., 1928, **199,** 1,318.
7. Peters, J. P., Bulger, H. A., and Eisenman, A. J.: Total Acid-base Equilibrium of Plasma in Health and Diseases. J. Biol. Chem., 1926, **67,** 159.
8. Marriott, W. M., and Davidson, L. T.: The Acidity of the Gastric Contents of Infants. Am. J. Dis. Child., 1923, **26,** 542.
9. Marriott, W. M., and Hartmann, A. F.: Newer Aspects of Acidosis. J. A. M. A., 1928, **91,** 1,675.
10. Hartmann, A. F., and Smyth, F. S.: Chemical Changes in the Body Occurring as the Result of Vomiting. Am. J. Dis. Child., 1926, **32,** 1.
11. Hartmann, A. F.: The Effects of Diarrhea, Vomiting, Dehydration and Oliguria on the Acid-base Balance of the Plasma of Infants with Mastoiditis. Am. J. Dis. Child., 1928, **35,** 557.
12. Hartmann, A. F., and Darrow, D. C.: The Composition of the Plasma in Severe Diabetic Acidosis and the Changes Taking Place During Recovery. J. Clin. Investigation, 1928, **6,** 257.
13. Hartmann, A. F.: Acidosis, Alkalosis and Dehydration. Colorado Med., 1929, **26,** 373.

ABSTRACTS OF PAPERS READ BEFORE THE SOCIETY

"The Prophylaxis and Treatment of Septic Meningitis,"* **John A. Kolmer, M.D.,** Professor of Medicine, Temple University, Philadelphia.

1. Vaccination: In selected cases of chronic sinusitis and otitis and especially ethmoiditis, in which extensive operative procedures are required, with the possibility of secondary meningitis, it is recommended that very careful bacteriological examinations be made with the preparation of autogenous vaccines containing approximately 1,000,000,000 organisms per cc. When time permits at least 6 to 8 doses should be given at intervals of 4 to 7 days. For adults the first dose may be 0.2 cc. by subcutaneous injection and subsequent doses gradually increased until 1 cc. is being given. Intracutaneous injections of 0.2 cc. per dose (not increased) may result in better immunization. Operation may be done about 1 week after the last dose.

2. Serum Prophylaxis: Fortunately, meningitis develops in only a small percentage of cases of infection of the sinuses and mastoids but it is hoped that clinical experience and knowledge have arrived at the point at which certain types of infection are known to be particularly dangerous from the standpoint of meningitis, and

---

* Presented April 12, 1933.

that at least some attempt will be made to protect patients from them. At least, it is usually possible to ascertain before operation the etiologic nature of chronic infections of the sinuses and otitis media, and it is always possible to make smears and cultures of mastoid cells at the time of operation and thereby ascertain the nature of the infection within from 24 to 48 hours thereafter. In this connection it is proper to place emphasis on the necessity of using blood agar or brain-hormone-dextrose broth (the latter preferred) for making cultures since streptococci or pneumococci may fail to develop on plain agar, and this may readily lead to error.

Not infrequently, cultures of pus from infected sinuses and middle ears show the presence of staphylococci in pure culture, and these organisms are very much less likely to result in meningitis, but this conclusion as to the nature of the infection is acceptable only when the cultures have been properly made on either of the aforementioned enriched mediums or on suitable substitutes by an oto-rhinologist.

If pneumococci are found it is advisable to determine the type, which requires an additional 18 to 24 hours, because this information is of value from the standpoint of dosage of serum and prognosis. In infections of adults with Type 1 pneumococcus, 10 cc. of Felton's concentrated antipneumococcus serum may be injected intramuscularly just before or immediately after operation; a second dose may be given the following day, and a third dose 4 days later. In infections with pneumococcus Type II and Group IV, the same dosage, or 15 cc., should be used; in infections with Type III pneumococcus, a dosage of 20 cc. should be employed. The same doses may be given to children over 10 years of age, half doses to younger children. In infections with the pneumococcus, 5 gr. (0.324 gm.) ethylhydrochloride with milk may be given every 5 hours for 3 days after operation in addition to the serum; children require less, according to weight.

In infections with the streptococcus, a therapeutic syringeful of concentrated polyvalent antistreptococcus serum may be given just before or immediately after operation, repeated the following day and again 4 days later (in unusually severe infections), or an intramuscular injection may be given for the first dose, followed by one or two doses at the same intervals. Children under 10 years may receive about one-half of these amounts.

3. Treatment of Early Meningitis: Upon the development of signs and symptoms of meningitis, spinal puncture may be conducted for the slow removal of about 3 to 5 cc. of fluid. If examination discloses the presence of a localized "meningismus" or meningitis there should be a complete exenteration of the cells in cases of acute mastoiditis and radical operation in cases of chronic suppurative otitis media. If the portal of infection has been the labyrinth, thorough drainage should be established through the labyrinth, and in all cases it is advisable to incise the dura at the site of operation. In sinus cases very careful thought should be given to operation for the purpose of affording the best possible drainage. The intake of fluids may be increased and spinal drainage conducted every 6 to 8 hours. Intracarotid and subthecal medication may be omitted.

4. Treatment of Diffuse Meningitis: If the above measures fail to check the infection or if the clinical and spinal-fluid examination disclose a spreading type of meningitis,more radical measures should be decided upon without delay because there appears to be little or no hope for success in the treatment of advanced cases. The operative procedures outlined above require first consideration and attention for the purpose of affording the best possible local drainage of the portal of infection. Laminectomy and continuous spinal drainage should be seriously considered, followed by forcing the intake of fluids up to 4 or 5 liters a day (Spurling).

If the intracarotid method is decided upon the treatment may be arranged as follows: For Type I pneumococcus meningitis the injection of 10 cc. of Felton's concentrated antipneumococcus serum, reinforced with 0.5 cc. of 1:100 optochin hydrochloride, into each common carotid artery. Immediately afterward, a cisternal puncture should be made with thorough drainage of fluid and the slow intracisternal injection of from 3 to 5 cc. of the mixture. Or if cisternal drainage cannot be done, a thorough spinal drainage may be made, followed by the intraspinal injection of from 10 to 20 cc. of the serum-optochin mixture. Six hours later another spinal drainage may be made, followed by additional drainages every 6 hours while the intake of fluids is pushed to 4 or 5 liters a day for adults, and children in proportion. This covers the treatment for 24 hours and should be repeated daily for at least 2 to 5 or more days, regardless of the clinical improvement of the patient.

In Type II pneumococcus meningitis the same plan of treatment may be followed except that the dose of serum injected into each artery is raised to 15 cc., and in Type III infections to 20 cc., since the serum contains much less antibody for these types. I have had no experience with Group IV infections, but since the serum has not been without some benefit in the treatment of Group IV pneumonia, despite the absence of antibody and probably because of nonspecific protein effects, it may be worth trying in the 10 cc. dosage.

In streptococcus meningitis the same plan of treatment may be followed except that about 10 cc. of concentrated polyvalent antistreptococcus serum mixed with 10 cc. of Pregl's solution of iodine are injected intracarotidally and the serum alone intracisternally or intraspinally. It is also necessary to conduct blood cultures at frequent intervals and especially if lateral sinus thrombosis is suspected or known to be present.

If serum cannot be employed, one may inject 10 cc. of 0.5 per cent solution of neutral acriflavine or 10 cc. of concentrated Pregl's solution of iodine into each common carotid artery followed by cisternal or intraspinal injection of these agents, but the results of our animal experiments with them have met with no success. The drainages, however, should be repeated every 6 hours; this procedure finishes the program for 24 hours and should be repeated daily for at least 3 to 5 or more days.

In staphylococcus meningitis, Pregl's solution of iodine may be employed in the same manner, or one may employ neutral acriflavine as described.

Finally, it would appear that, in severe meningococcus meningitis resistant to ordinary intravenous and intraspinal treatment with antimeningococcus serum, the injection of 10 cc. of serum each into common carotid artery, followed by cisternal drainage and the injection of from 10 to 30 cc. may be worth while. Here again it would appear advisable to drain at intervals of 8 hours and to repeat the serum injections at daily intervals.

Possibly intracarotid treatment may be combined with continuous spinal drainage by laminectomy and the forced intake of fluids up to 4 or 5 liters a day; this would appear to be a more hopeful procedure.

The quadruple or cerebral-cisternal-spinal lavage method has not proven as hopeful in results, and if tried at all must be instituted as promptly as possible before the inflammatory exudates have become plastic. It may be conducted somewhat as follows for the treatment of pneumococcus meningitis:

(a) Ether anesthesia and bilateral trephining at points well upward toward the longitudinal sinus and well forward in the frontal region to obtain the maximum lavage of the cerebral hemispheres and bathing with Felton's concentrated serum and ethylhydrocupreine hydrochloride mixtures.

(b) The introduction of needles into the lumbar subarachnoid space and cisterna magna followed by the drainage of fluid.

(c) The introduction of warm physiologic solution of sodium chloride into the lumbar region until the return solution from the cistern is practically clear (as determined by collection in a test tube, since inspection of the fluid as it flows from the needle is deceptive). From 25 to 50 cc. of physiologic solution of sodium chloride may be required.

(d) The injection of serum and ethylhydrocupreine hydrochloride mixture through the lumbar needle until it flows from the cisternal needle, followed by removal of the lumbar needle.

(e) With the cisternal needle in position, cerebral subdural injection of from 5 to 10 cc. of mixture on each side.

(f) The intracisternal injection of about 5 cc. of mixture, providing there are no respiratory difficulties, followed by removal of the needle.

(g) As an aid in combating toxemia and septicemia (indicated by positive blood cultures), injection of serum intravenously.

The doses advised are for persons of 12 years and upward; young children may receive less in proportion to age and size.

The outlook for patients with Type I and Type IV pneumococcus infections is doubtless much more hopeful than that for patients with Type II and Type III infections, but the same plan is advised for all.

In streptococcus meningitis, the same plan of treatment is advised, although the outlook for success is less than in pneumococcus meningitis, even though the exudates become less rapidly plastic because polyvalent antistreptococcus serum is less efficient than pneumococcus antibody solution and Type I antipneumococcus serum. Furthermore, there is no chemotherapeutic agent for streptococcus infections comparable to ethylhydrocupreine hydrochloride for pneumococcus infections, although I believe that the addition of gentian violet or neutral acriflavine to antistreptococcus serum appreciably enhances its streptococcidal activities. A concentrated polyvalent antistreptococcus serum, therefore, may be employed, and to each 25 cc. one may add 1 cc. of a 1:100 solution of gentian violet (Doleman and Bell) or acriflavine in sterile saline solution.

When Does Disease Begin? Can This Be Determined By Health Examination?—It would seem to be easy to speak positively on this subject, but disease may begin in just a few cells and spread quickly or slowly with or without sensation. Fortunately for the patient, but unfortunately for the physician when he is endeavoring to locate the beginning of disease, Nature is able to compensate in various ways for the loss of a quantity of glandular, digestive or absorptive tissue, also of organs of elimination, and, should suffering not ensue, the patient does not realize the deficiency or that he is sick, or that he soon will be appreciably sick. If one kidney is removed, the other is able to carry on the work: not infrequently there is but one kidney at birth. This is true of all of the double organs, the parathyroid bodies, the suprarenal glands, and so forth. Naturally, this life-saving compensatory effort of Nature's mechanism adds greatly to the problem of medicine. The physician daily sees patients who come for relief of one trouble and who have various symptoms that suggest the possibility of other troubles, and unless a most elaborate series of tests is carried out for at least some of these apparently non-essential conditions, the physician may, and frequently does, miss the beginnings of essential disease. Then the patient again presents himself because of these troubles, when they become a nuisance, in many cases only to be relieved by surgical sacrifice of tissue. Examination must be within reason for the sick, or near-sick, and its extent will be based on the judgment and experience of the physician.

We cannot find out much about slowly developing chronic disease until it is distinctly chronic, which means that there is more or less destruction of tissue or of function, leading the patient to seek relief. However, we do know that in most recurring diseases, and in some chronic diseases, there is a focus if the patient is less than forty years of age, and more than one focus if the patient is more than fifty years of age. We can find out about the acute diseases of childhood, and those which occur after the entrance of organisms with inspired air or with food. Some of these organisms are local in effect, but sometimes they enter the blood stream and cause general symptoms.

A good many people accept illness as if it were predestined, submitting to it without thought of prevention. The average person has not yet learned the meaning of the term "positive health" and all that it implies in the way of joy of living and efficiency. If we were to adopt the criteria of the public concerning disease, "disease", meaning "parting from ease," there should be some symptom, and the one symptom that all people think of is pain. If there is no discomfort they think there is no disease, unless some accident or injury has taken place, or unless there is some question of muscular trouble. Even a growth or tumor may be present without the suspicion of the patient being aroused.—Charles H. Mayo, M.D., Extracted from The Diplomate, 1932 (June) 4:175.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D. C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D. Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1932-33
President .... Harry A. Fowler, M.D.
1st Vice-President .... Henry R. Schreiber, M.D.
2nd Vice-President .... H. Gladys Kain, M.D.
Secretary-Treasurer .... Coursen B. Conklin, MD.

ESTABLISHING ISOLATION IN THE PRIVATE HOME

The principal diseases in which isolation at home is a practicable measure are scarlet fever and diphtheria. In measles, in spite of the great danger to infants, isolation is seldom effective because infection has usually spread to other children of the household before the first case is recognized. In typhoid fever, home isolation should, whenever possible, be discarded in favor of hospitalization in order that the patient may have the advantage of better medical and nursing services. In chickenpox or mumps, the mildness of the disease makes isolation scarcely worth while. These remarks shall pertain, therefore, primarily to the home isolation of diphtheria and scarlet fever.

The physician should make a practice of ordering isolation not only for each diagnosed communicable case but for each suspect. The physician's emphasis on suspects will, in the long run, probably prevent more secondary cases than the same emphasis on recognized cases. When isolation is being ordered, a reasonable amount of concern and sympathy should be shown because the householder is nearly always much disturbed by the prospect of household inconveniences and the fear of spreading contagion.

At this time, I suggest that the following points be taken up in order:

First, the prognosis of the patient. Taking this point up first relieves the parent of anxiety over the sick child so that her attention is free for the subject of isolation.

Second, the question of home versus hospital care. The question should be decided in favor of hospitalization for two types of cases: (a) Those in which the patient needs the hospital care for his own sake; (b) those in which home isolation can not be made satisfactory because there are other children in the family with no responsible adult to care for them. A satisfactory arrangement can frequently be made for the second type of case by having some family connection come into the home and take care of the general housework, leaving the entire time of the mother for the patient. It is even more satisfactory to send the well children to the home of a relative where there are no other children.

Third, the protection of contacts with prophylactic inoculations. In diphtheria, a good rule is to give contact children antitoxin only if they have not had toxoid or toxin-antitoxin or, when a previously inoculated child cannot be observed frequently. Scarlet fever antitoxin, being frequently followed by serum reactions, should be given only when the health of the contact child is such that he would have a poor prognosis if attacked by scarlet fever.

Fourth, the general household arrangement, such as the assigning of duties to various members and the setting aside of a room or group of rooms for isolation.

Fifth, the rules of the Health Department* concerning leaving and entering the house.

---

* In the District of Columbia and the State of Maryland, contacts are quarantined as follows:

Diphtheria and Scarlet Fever—Children contacts are excluded from school and from contact with other children. Adult contacts are excluded from occupations requiring contact with children or handling of food. The contact who at-

Sixth, the technic of isolation. This item is left until the last because it depends largely on how other things are arranged. At the beginning of his directions, the physician should explain that germs come from the mouth and nose; that they are carried on fingers, handkerchiefs, dishes, towels, and other objects; and that they are not able to pass through the air except for a distance of about three feet during coughing or sneezing. The technic should be explained in detail, and the attendant asked to demonstrate parts of her instructions. Emphasis should be placed on the following items:

1. Explanation that the door of the isolation room or suite is the dividing line between infection and non-infection.

2. Importance of the attendant washing her hands before leaving the sick room.

3. The proper method of getting food to the sick room. There are two satisfactory methods. In the first, a set of dishes is kept in the sick room and washed there after each meal. Someone other than the attendant brings the meals to the door of the sick room, meets the attendant and puts the food onto the patient's dishes without physical contact between the two sets of dishes. In the second method, instead of having separate dishes for the patient, the patient's dishes are taken to the kitchen after each meal and boiled. To do this properly, someone brings a pan to the door of the sick room, holds it while the attendant puts the dishes into it and carries it back to the kitchen stove. If the physician omits details regarding dishes and gives only the general order to "boil the dishes after each meal," the faulty technic employed will be likely to result in contamination after each meal of the kitchen door knob, drain board, cupboard, spigot handle, stove handle and match box.

4. The fact that concurrent disinfection is far more important than terminal disinfection, and that in terminal disinfection thorough cleaning is of greater value than fumigation. For terminal disinfection, the householder may be referred to a printed circular and should not expect the physician to take the time to give detailed directions.

5. The difficulty in scarlet fever of preventing exposure in the later part of the isolation period when the patient is out of bed.

To give isolation instructions satisfactorily, considerable time is required, more time than the physician can spare if he is in the midst of a busy day. One way to save time is to ask the family to wait for the visit of the health officer or nurse. The objection to this is that unless the case is immediately reported by telephone, the establishment of isolation is postponed about one day. In Montgomery County, each nurse in her communicable disease visits asks if the physician has said that he wishes her to give the isolation directions. Another and a better way in which the physician may save time is to give out printed or typed directions. Parents can usually be depended upon to read these because their interest at the time makes them keen for instructions. A few spoken directions to clarify the written ones are very effective.

V. L. Ellicott, M.D., D.P.H.,
Health Officer, Montgomery County, Maryland.

ACTIVITIES OF SECTIONS

Section on Nervous and Mental Diseases

Minutes of the Meeting Held April 6, 1933

The meeting was called to order at 8:15 P.M. by Major C. C. Odom, Vice Chairman. The minutes of the preceding meeting were read

---

tends the patient must wash her hands and change her outer clothing before leaving the house.

Typhoid Fever —Children and adult contacts are excluded from occupations requiring the handling of food.

Measles, Whooping Cough, Chicken-pox and Mumps—The susceptible contacts of measles and whooping cough are excluded from school during the incubation period. Those of chickenpox and mumps are allowed to attend school if they receive daily inspections on reaching school. Immunes are not quarantined.

Return to School—In the District of Columbia, a child excluded from school may be re-admitted only on a certificate signed by a Health Department physician. In the State of Maryland, re-admission is by a certificate signed by the attending physician.

and approved. Members present included Drs. C. C. Odom, H. D. Shapiro, R. S. Cohen, Walter Freeman, K. H. Langenstrass, and about 50 visitors.

Scientific Program

Symposium on Epidemic Encephalitis

1. "Etiology." **Earl Baldwin McKinley, M.D.**

Since 1915 some 85,000 cases of encephalitis have been reported. The cause of encephalitis is still unknown. Levaditi and Harvier obtained a virus in 1922, and since then 8 other similar viruses have been isolated from attempts in many hundreds of cases. This virus closely resembles the common herpes virus. In encephalitis there is loss of the neutralizing power of the serum against herpes. Since rabbits are susceptible to a spontaneous encephalitis, monkeys make better subjects for experiment. The Macacus is resistant to herpes and the Cebus to poliomyelitis, so that future experiments may establish the etiology. A number of conditions resemble epidemic encephalitis but have to be distinguished, there being apparently no crossed immunity. The question of the bacterial etiology of encephalitis is not yet established. By indirect inoculation of nasopharyngeal washings into rabbit brains, Rosenow was able to produce encephalitis with recovery of pure cultures of green-producing streptococci in the brain; but McKinley's control experiments with washings from normal people resulted in similar findings. The encephalitis virus in Cebus monkeys is often associated with streptococci in the brain, but these may be interim invaders, since streptococci have been obtained in blood cultures from 44 out of 200 monkeys. Present evidence is against a bacterial cause, but the ultimate cause remains unknown.

In discussion, **Dr. Alice C. Evans** stated that in contrast to the 9 strains of virus isolated from cases of encephalitis, 23 workers have cultivated streptococci. In her own 20 cases there were diplococci in smears of the spinal fluid in 2 cases, in 5 cases they were obtained from the nasopharynx and spinal fluid, and in 2 more cases at necropsy. They may exist in forms not adapted to artificial cultivation. Streptococci can be cultivated from filtrates of herpes virus, indicating possibly that there are stages in the life cycle during which the organism becomes filtrable, changes its form, behaves as a virus or becomes cultivable. Examples of similar character, that is, filter-passing virus with cultivable organisms, are found in measles, and especially in trachoma. The great need is for more adequate cultural methods. Whatever the cause, it would seem that the organism is not a new one but that it has gained unusual power to enter the brain, possibly from lowered resistance.

Dr. Robert A. Keilty reported the results of a study of 20 cases in which the blood and spinal fluid were cultured. The fluid was placed directly in the broth and cultivated in duplicate, both aerobically and anaerobically. Controls were also run, and all were continued for long periods since some cultures become positive in 72 days. Eight cases were acute and 12 chronic. Fifteen showed growth, mostly anaerobic, but no single particular organism was found. He was also inclined to consider the life cycles of the organism important. In some cases he found ordinary staphylococci, which were considered contaminants, and in 3 cases Bacillus subtilis was isolated. These were also excluded. A small, slow-growing staphylococcus was considered important; a bacillary form was occasionally isolated, and 4 varieties of streptococci showing slight variation in cultural type were recovered.

Dr. Winifred M. Ashby studied 9 autopsy cases, 5 with encephalitis, with 4 controls. In all of these some organism was found in the midbrain and in 4 cases not in the cerebrum or blood stream. Organisms similar to those found in the midbrain were also found in the lungs. Dr. Ashby believed that organisms lodged in the midbrain during the course of the disease.

In closing, **Dr. McKinley** said that microbic variation was an important phenomenon but should not be a cause for claiming identity of virus and cultivable organism. Breaking down of the hemato-encephalic barrier might well be the cause of encephalitis.

2. "Pathology." **Walter Freeman, M.D.**

Encephalitis, in the broad sense, is any inflammation of the brain. Excluding the acute septic and meningitic cases and the specific infections of syphilis, tuberculosis, etc., there is a group of non-suppurative encephalitides divisible into 3 types: the polioencephalitides (poliomyelitis, encephalitis, rabies, herpes zoster), the demyelinating encephalitides, (multiple sclerosis, post-infectious encephalomyelitis, etc.) and the rickettsial encephalitides (typhus, tick fever, etc.). Epidemic encephalitis is characterized by acute non-suppurative inflammation centering about the midbrain, with destructive effect, especially in the substantia nigra. Perivascular and diffuse infiltrations characterize this area, whereas the inflammatory reaction around the vessels spreads to the walls of the third ventricle and basal ganglia and down through the tegmentum of the pons and medulla into the cord. The hypothalamic structures are often involved, but only the substantia nigra shows active cellular destruction. The extent of the findings depends upon the duration and tempo of the disease. Occasionally the cerebral cortex is involved, but scarcely ever the cerebellar. In the chronic cases the only significant cellular destruction is in the substantia nigra, although other syndromes such as hepatolenticular degeneration, spinal muscular atrophy and narcolepsy would indicate lesions elsewhere. Inflammatory phenomena may be persistent but are usually manifested only by occasional infiltrating cells and accumulation of fat in the glial scar. The rare cases of cortical inflammation resemble paresis except for the absence of the Spatz reaction.

In discussion, **Dr. L. B. Hohman** reported verification of the findings in chronic encephalitis in 12 cases, which were quite uniform in character.

Major Odom asked about those cases in which the appearance of the symptoms was delayed for 2 or 3 years after an acute non-specific illness.

Dr. Freeman closed by saying that in many cases there is no history of an acute attack but that parkinsonism develops insidiously and that he believed in most cases paralysis agitans is nothing more than chronic encephalitis.

3. "Clinical Aspects Including Treatment." **Leslie B. Hohman, M.D.,** Baltimore, Md.

Acute epidemic encephalitis is a disease of protean manifestations. It often starts like influenza with fever and prostration, to be followed by diplopia and somnolence. The symptoms may shift rapidly. Bulbar symptoms are transitory. The pupils are often disturbed; there is sometimes an irregular nystagmus, which has been designated eye muscle tantrums. Convulsions and sweats are rarer complications. Another form which the acute disease may take is characterized by fears, by tics, by pains of neuritic, radicular or central type, by delirium of fever and hypomania, and by peculiar pressure of good-natured talk, which the author has found almost characteristic. Respiratory disturbances are frequent in children, and chorea is fairly common, occasionally going on to torsion spasms. All of the manifestations of the so-called sequelae may be found in the acute phases, even the masking of the face, the hypertonus and the tremors. Trophic disturbances are not uncommon, especially salivation, sweating and seborrhea, and diurnal variations are apt to be noted. Symptoms resembling acute bulbar palsy or amyotrophic lateral sclerosis or pseudotabes are occasionally encountered. Mental phenomena such as hysteroid attacks may resemble malingering. Impulsive acts, psychoneurotic complaints and silly attempts at suicide are found, while intellectual impairment with loss of memory and judgment, organic reduction and confabulation are less frequently observed. There is often a neurasthenic aftermath of the acute disease that suggests the possibility of an organic component in other so-called psychogenic syndromes. Among the chronic forms, the parkinsonian is the most common, with the characteristic masking of the face, rigidity of the limbs, propulsion and salivation. Obsessive crossing of the legs, repetition of acts, tic-like movements and oculogyric crises may be observed, while in children uncontrollable psychopathic behavior renders them burdensome in their surroundings. Narcolepsy may develop or there may be inversion of the sleep rhythm, tics of various types and compulsive spitting.

Many remedies have been proposed but few results. The 2 favorite ones have been convalescent serum and Pregl's iodine; on the whole, no specific is known. In palliative treatment of parkinsonism, hyoscine is best, the dosage being worked up gradually to 1/25 gr., 4 times a day. Stramonium is less effective, but large doses may get the patient out of bed.

In discussion, **Dr. Neustadt** stated that at Bellevue Hospital, N. Y. encephalograms in chronic cases have been followed by diminution in the rigidity and tremor.

Dr. Freeman remarked that in 11 acute cases, 4 were treated symptomatically, with 1 recovery, 1 residual torsion spasm and 2 deaths; 3 were treated by serum alone (prepared by Mulford by immunizing a horse against the first streptococcus obtained by Alice Evans) with 2 recoveries and 1 residual facial tic; one was treated by vaccine alone, with hypochondriasis persisting and suicide after 6 years; 3 were treated by serum and vaccine, with recovery in all. All the recoveries have lasted more than 5 years. The chronic cases of parkinsonism of which 41 have been under observation, have shown no difference between those receiving symptomatic treatment (23) and those receiving autogenous vaccine prepared by Dr. Keilty (18). In 8 latent and non-parkinsonian cases, all have either recovered or improved under symptomatic treatment. Dr. Freeman raised the question of intolerance to hyoscine and the value of stramonium in such cases.

In closing, **Dr. Hohman** stated that intolerance to hyoscine was rare but that the dose must be raised slowly. He added that the spinal fluid in the acute cases shows pleocytosis, with increase in glucose for the first 2 weeks of the disease.

NEW ELECTED OFFICERS OF SCIENTIFIC SECTIONS

Section on Internal Medicine

James W. Esler, Chairman
B. W. Leonard, Vice Chairman
A. J. B. Connolly, Secretary-Treasurer

Section on Ophthalmology and Oto-Laryngology

George B. Trible, Chairman
Ralph S. Pendexter, Vice Chairman
Harry F. Davies, Secretary
John H. Trinder, Treasurer

Executive Committee

Albert P. Tibbets
Boyce R. Bolton
Carl Henning

A PROGRESSIVE MOVEMENT

Transaction of Business Facilitated

*In the abolishment of certain committees which heretofore have functioned apart from any definitely directing force and the reorganization and renaming of the Committee on Civic Health, a forward step has been taken in that there will be a more efficient and smoothly working mechanism for the transaction of business. Drs. Prentiss Willson, the President-elect, and now Chairman of the Executive Committee, Thomas A. Groover, Henry C. Macatee and William H. Hough, have been most active in perfecting a reorganization of the Executive Committee with subcommittees having such designation as Legislative, Finance, Business Affairs, Membership, Hospital, and Library. Matters given to any particular subcommittee will be first thoroughly digested and then presented to the Executive Committee as a whole. The plan includes the centralization of all matters affecting public health in the standing Committee on Civic Health; a constitutional change will make this the "Committee on Public Health." Subcommittees of this committee will handle such problems as communicable diseases, tuberculosis, venereal diseases, and general sanitation. There will be a total membership of 17. It should be noted that the chairmen of standing committees are ex officio members of the Executive Committee. The general chairman of the all-important Committee on Public Health will thus sit in at the Executive Committee meetings. In view is a more expeditious handling of business and an apparent obviating of long Executive Committee sessions without effective action being possible in a reasonable lapse of time.

---

* Action of Society, May 3 1933.

MEETING OF THE SOCIETY HELD MAY 31, 1933

Presidential Address

On the evening of May 31, 1933, before a large assembly of members of the Society, members of the Woman's Auxiliary and guests, Dr. Harry A. Fowler read his presidential address, "The Currents and Trends in Present-Day Medicine." A masterly review of the present economic and social changes as they affect the practitioner of medicine was given. The adjustments to changing times must not cause the sacrifice of the high "ethical and professional concepts which have grown up through the centuries and which have become a vital part of medical art. . . ." At its conclusion, upon motion by Dr. R. Arthur Hooe, Dr. Fowler was given a rising vote of thanks for his excellent work as a presiding officer during the year. Seated on the platform were Past Presidents: D. Kerfoot Shute (1907), Noble P. Barnes (1910), John B. Nichols (1912), Frank Leech (1915), Edward Y. Davidson (1916), William Gerry Morgan (1919), Francis R. Hagner (1920), H. C. Macatee (1921), John D. Thomas (1924), Thomas A. Groover (1925), Joseph S. Wall (1926), Oscar B. Hunter (1928), Harry H. Kerr (1929), William H. Hough (1930–31), Arthur C. Christie (1931–32); First Vice-President Henry R. Schreiber, and President-elect Prentiss Willson.

Unveiling of Oil Painting of Dr. William Gerry Morgan

Dr. Thomas A. Groover, who was chairman of a committee which selected the mode of expressing the Society's appreciation of Dr. Morgan's worth to the Society and his accomplishments for organized medicine, in an address, paid tribute to art, and to the esteem in which the Doctor is held. He mentioned particularly his own high estimate of Dr. Morgan's standing in the art of medicine. It was made plain that he did not at all deprecate his scientific attainments. His belief in the influence of Dr. Morgan's highly developed art in the practice of medicine as a factor in bringing success was emphasized. The appropriateness of the selecting of the painting as a gift and particularly its enduring stimulus to coming generations in the Society were made plain. Dr. Groover, at the conclusion of his well-chosen words, unveiled the portrait. Dr. Morgan accepted the gift, expressing his thanks and appreciation of the merit of the artist's work. He then tendered the painting to the Society stating that here should be its resting place, leaving the location in the building entirely to the desires of the Society. At this point Mr. Bjorn Egeli, the artist, was asked to rise. He was greeted with prolonged applause. The President, Dr. Fowler, received the painting on behalf of the membership.

GEORGE WASHINGTON UNIVERSITY FACULTY ADDITIONS

The following new full-time appointments have been announced in the School of Medicine, George Washington University:

Edward Bright Vedder, M.D.—*Professor of Experimental Medicine and Executive Officer, Department of Pathology and Experimental Medicine.*
William Henry Waller, Ph.D.—*Instructor in Anatomy.*
Jesse Harmon, B.S., Ph.D.—*Instructor in Biochemistry.*
Hubert Scott Loring, B.S., Ph.D.—*Instructor in Biochemistry.*
James Leslie Snyder, B.S., M.D.—*Instructor in Pathology.*
John Ralston Pate, A.B., M.D.—*Teaching Fellow in Anatomy.*

CONTRACT PRACTICE

Practice of Medicine by Insurance Companies*

"Something has been said about insurance companies and how we ought to 'contact' the insurance companies. We are perfectly willing to 'contact' them; we have 'contacted' them. But in most instances the 'contacts' have ended, for the time being at least, when it has developed that the medical service to be delivered under their policies is to be altogether subject to the choice and direction of the companies. There are few exceptions to this rule. Insofar as I am concerned, I am not willing, with the interest of the public in mind and with the interest of scientific medicine in mind, to turn over the practice of medicine to an insurance company or to any other corporation. I am not willing to turn it over to anybody except the medical profession, and unless the mandate comes from the organized medical profession, when it has been convinced that socialization is best, I will oppose any movement designed to socialize medicine and to subject the practice of medicine to political domination."

---

* Reprinted from article by Seale Harris, M.D., Alabama. Quoted from discussion of Olin West, M.D., "Contract Practice," A. M. A. Conference of Secretaries, 1932.

If the organized medical profession of the United States has the vision and the courage to face the insurance proposition squarely before too many of its members have contracted with insurance companies to provide medical care for their policy holders, it will be saved from vassalage to commercial institutions. If we sit down and wait for the "other fellow" to do something about it, health insurance which will pauperize a large proportion of the doctors in every community in the nation, will become so established that it will not be possible to break its strangle hold on the public; and sooner or later the states, or the national government, will take over health insurance as Germany, Austria, Russia and England have done. "An ounce of prevention is worth a pound of cure" in dealing with the sinister influences both inside and outside the medical profession.

Health insurance is highly desirable when it pays the policy holder a stipulated amount of money each week during illness or disability from accidents, thus allowing the individual to select his physician and his hospital; but the health insurance which intends for its beneficiaries to receive medical attention by company physicians, in subsidized hospitals, is a menace to the public, because it will provide inefficient medical service, and it endangers medical initiative and medical independence because by that plan doctors will become merely hired men of the insurance companies.

Every county medical society, every state medical association and the American Medical Association, during the year 1933, at the earliest possible meeting, should adopt ordinances, or by-laws to their constitutions, outlawing the practice of medicine by insurance companies. If prompt action is taken the insurance companies will abandon their plans to employ doctors to care for the sick among their policy holders.

There can be no objection to casualty or other insurance companies employing their own physicians to provide surgical attention to employees of corporations in case of accident, or other injuries, for which corporations are liable under the compensation acts of various states; and certainly insurance companies have the right to employ physicians to examine their policy holders in case of illness in order to prevent being imposed upon by the policy holders, but the employment of a physician, or a group of physicians, by insurance companies to practice medicine for them is most reprehensible and should not be permitted.

THE TEXAS PLAN FOR CONTROL OF CONTRACT PRACTICE

The contract practice problem has been disposed of very satisfactorily in Texas; and the Dallas plan, if adopted in every city and state in the Nation, would eradicate the evils of industrial medicine. A number of Dallas physicians had contracts for the medical care of the employees of several corporations. Eighteen Dallas physicians were suspended from membership in the Dallas Medical Society for participating in those contracts. They appealed to the State Medical Association, which upheld the ban on contract practice by the Dallas Society. The physicians having contracts then appealed to the American Medical Association which sustained the action of the Dallas County Medical Society and the Texas State Medical Association; whereupon the 18 physicians gave up their contracts, and corporation practice except for emergency surgery and in lumber camps and mining camps has been eliminated from Texas. The following amendment to the by-laws of the Dallas County Medical Society, was upheld by the Texas State Medical Association and by the Judicial Council of the American Medical Association:

"No member or combination of members shall either directly or indirectly enter into contracts or agreements to render professional service under the system known as Contract Practice except in situations wherein the needed medical and surgical services cannot otherwise be obtained. (As, for instance, railroad surgeons, physicians of mining camps, lumber camps, instances to meet necessities of patients to be served.)"

"Any member or members entering into contract with individuals, corporations or other concerns to provide medical and surgical services for groups of individuals, or individual groups, to cover a period of time, for stipulated remuneration shall be in violation of this regulation and subject to the penalty otherwise provided for unethical conduct."

Most of the physicians with whom I have discussed the subject, while they disapprove of the majority plan, say that "the insurance companies, or the state, or both will take over the practice of medicine and there is nothing that we can do about it." Fortunately those in authority in the American Medical Association do not take that attitude, and individualism in medicine will not be sacrificed on the altars of the ignorance of socialism or the greed of industrialism and insurance commercialism.

VIRGINIA, MARYLAND AND DISTRICT OF COLUMBIA MEDICAL SOCIETY

On May 24, 1933, at a meeting held in the George Mason Hotel, Alexandria, Va., the following officers were elected:

Frank J. Broschart, Gaithersburg, Md., *President*
C. C. Tumbleson, Sandy Spring, Md., *Vice-President*
James A. Gannon, Washington, D. C., *Recording Secretary*
A. Magruder MacDonald, Washington, D. C., *Corresponding Secretary*
Robert Scott Lamb, Washington, D. C., *Treasurer*

Participating in the scientific program were: Oscar B. Hunter, William P. Herbst, Lyle M. Mason, William Thornwall Davis, D. Percy Hickling, of Washington, D. C., and Samuel B. Moore, of Alexandria, Va.

Of special interest was the election of Dr. D. Kerfoot Shute to honorary membership. This was done through the unanimous adoption of a special resolution.

WOMEN'S MEDICAL SOCIETY

At the home of Dr. Louise Tayler-Jones, on the evening of June 3, 1933, was held the annual banquet of this District of Columbia medical organization. Officers were elected as follows:

Edith SeVille Coale, *President*
Lucile Dooley, *Vice-President*
Elizabeth Chickering, *Recording Secretary*
Alma Jane Speer, *Corresponding Secretary*
Kate B. Karpeles, *Treasurer*

A requisite for membership in this organization is membership in the Medical Society of the District of Columbia.

Joseph Lorenzo Chase

1870 – 1933

On the evening of May 3, 1933, Dr. Edward Y. Davidson, before a regular meeting of the Society, paid tribute to a deceased faithful janitor of the Medical Society's Building who had efficiently performed the duties of this position since the building's erection:

> ". . . Chase loved the Medical Society, and this building was to him a shrine. He knew every member of the Society who attended its meetings, could call each member by name, and when the surname of a member was given to him to be put on the blackboard or screen he could always add to the surname of the member his initials. . . . He was scrupulously honest. He was more; he was the soul of honor. . . . He walked humbly, but he walked uprightly. . . . It may be truly said of him that he was faithful until death. . . ."

Through formal ballot, Dr. Davidson's words of appreciation were adopted and it was ordered that his address in its entirety be transcribed in the minutes of the Society and be transmitted to the relatives of the deceased.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II JULY, 1933 NUMBER 7

THOROTRAST ARTERIOGRAPHY AND VEINOGRAPHY*

L. S. OTELL, M.D., *Professor of Clinical Radiology*

FRED O. COE, M.D., *Professor of Radiology, Georgetown University School of Medicine*

AND

O. F. HEDLEY, M.D., *Passed Assistant Surgeon, United States Public Health Service*

Our purpose in presenting this paper before the Society is merely to better acquaint the members and guests with a comparatively newly developed field of roentgenography, and to stress the practicability of the visualization of the extra-cardiac vascular system.

With the aid of Thorotrast as a contrast medium it is possible to clearly visualize the cerebral arteries, the peripheral arteries and veins and to some extent the pulmonary arteries and the great efferent vessels of the heart.

HISTORY OF ARTERIOGRAPHY

The first recorded case of the roentgenological visualization of the vascular system was reported by Podres in 1898. He observed a lead shot which was floating in the heart of a patient following an injury to that organ. Soon afterwards, excised hearts were injected postmortem with opaque materials and studied roentgenologically. The first experimental work in living subjects to determine the possibility of the visualization of blood vessels was done by Schepelmann, who injected various heavy metallic compounds and oil suspensions into the blood stream. His results, however, were not convincing.

For the past 30 years or more investigators have been at a loss to find a medium that would answer all requirements. It must be (1) non-toxic, (2) non-irritating, (3) miscible with blood and body fluids, (4) of sufficient atomic weight to cast a good shadow on the film, and (5) readily eliminated from the blood stream. Such substances as collargol, quicksilver, bismuth-oil-suspension, bromic or iodic compounds, tetraiodophenolphthalein, calcium lactate, calcium chloride, "Dominal X," iodized oil and iron chloride have all been tried with unsatisfactory results. Up to 1930, sodium bromide and sodium iodide had been employed rather extensively. Reactions in the form of pain, iodine poisoning and extension of gangrene often followed injection of these materials. The iodized oils often gave rise to fat emboli. Saito, et al., prepared an emulsified oil with lecithin, protalbinacid, honey and distilled water and gave it the name of L'Ombre. Fairly satisfactory results were obtained. With the advent of intravenous urography, uroselectan and skiodan came into vogue as a good contrast medium. Udaondo claimed good results from the former and Pearse and Warren from the latter. An entirely satisfactory medium, however, was not found until Thorotrast became generally used.

Thorotrast is a stabilized thorium dioxide solution, of high atomic weight, miscible with blood and body fluids. It is non-toxic and non-irritating. It has been used extensively as a contrast medium in various parts of the body but more particularly for visualization of the liver and spleen. When injected into the blood stream it is phagocytosed by the reticulo-endothelial cells throughout the body, particularly by the Kupfer cells of the liver and the reticulum cells of the spleen. Since the preparation of Thorotrast by Radt and Oka in 1929 many hundreds of injections have been made in animals and humans. It has proved to be a valuable adjunct in the diagnosis of diseases of the liver and spleen. It has the objection of being stored in the body for an unknown period, being eliminated very slowly through the lungs, urine and bile. The amount necessary for visualization of the peripheral vessels varies from 1/8 to 1/3 of the amount necessary for visualization of the liver and spleen. Even large and excessive amounts, however, have shown no ill effects in animals and humans injected 5 years ago by Radt and Oka. Several patients injected by us over 2 years ago have shown no untoward reactions. Recently Thorotrast has been rejected by the Council on Pharmacy and Chemistry of the American Medical Association, mainly on the grounds of poor elimination and because of the possibility of latent harmful effects from its fairly high alpha-radioactivity and further increase in radioactivity by conversion to mesothorium, and the possibility of sensitization of the tissues to roentgen rays. We believe that we have disproved the last contention. Martland who has had extensive experience with radium poisoning in radium dial workers, says: "Theoretically the exposure to the use of any radioactive substance that will increase the normal radioactivity of the body is dangerous."

---

* Read at the Annual Scientific Assembly of the Society, April 25, 1933.

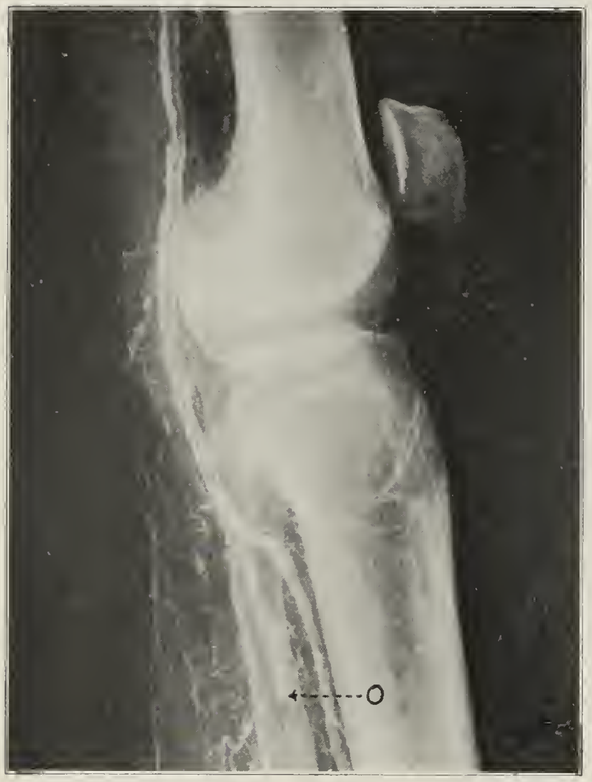


Fig. 1. Arteriogram, Case 1. Site of Obstruction of Posterior Tibial Artery Indicated by Arrow at *O*

Arteriography of the Extremities

Arteries may be injected directly through the skin but this method is sometimes difficult, particularly in the lower extremity and neck. A small incision is usually made and the artery is exposed. A medium-gauge needle is introduced either directly into the artery to be visualized or indirectly into it through one of its branches. The purpose of the latter procedure is to avoid the possibility of damage or thrombosis to the main trunk. Often in the upper extremity it is possible to palpate the artery with the fingers of one hand and after cocainization of the skin to inject directly into the vessels. One can readily tell when the artery has been entered by a gush of blood into the syringe. At this moment an ordinary blood pressure tourniquet which had previously been applied to the arm is inflated. Ten to 25 cc. of Thorotrast is injected, depending upon the extent of the vascular network which it is desired to visualize. Compression is relieved for 1 to 2 seconds and then applied again in order to allow the medium to permeate the smaller branches. Exposures are made in various planes while the needle still lies within the lumen of the artery. The needle is next removed and moderate compression is applied for 5 minutes to prevent bleeding.

Arterial Encephalography

For visualization of the cerebral vessels the common carotid and external carotid arteries are exposed and clamped and injection of 7 to 10 cc. of Thorotrast is made either directly into the internal carotid or indirectly through the lumen of the superior thyroid artery into the internal carotid. Rapid exposures are made just before the last of the medium leaves the syringe. Speed is necessary because of dilution from the opposite side through the collateral vessels. One week later the opposite side is injected and the roentgenograms of the two sides are compared.

INTRATHORACIC ARTERIOGRAPHY

The pulmonary vessels may be injected directly by injection of the medium through a sound, which passes from the fold in the arm to the right auricle; or indirectly by administering intravenously Thorotrast and isamine blue on alternate days for 4 days and taking a radiogram on the day following the last injection. By the latter method the pulmonary arteries and the thoracic aorta are sufficiently permeated to allow some visualization of these vessels.

For veinography a tourniquet is applied; injection is made in the vein distal to the tourniquet; the tourniquet is removed and the vein is injected fairly rapidly.

VALUE OF ARTERIOGRAPHY

The value of Thorotrast has been enthusiastically acclaimed by a number of investigators during the past 2 years. Most of the work has been confined to the cerebral vessels. Egas Moniz has found arterial encephalography to be of value in over 100 patients subjected to the test. In several of these cases he was able to localize brain tumors. Akaiwa and others have reported the same favorable results. Heuser was able to differentiate between tumors of vascular and non-vascular origin in the mediastinum, by visualizing the pulmonary vessels and the thoracic aorta. Stobberts was able to visualize the blood supply to the kidney in a living subject by injecting at operation 10 cc. of diluted Thorotrast into the renal artery. Loehr and Jacobi have used combined arterial encephalography and ventriculography, injecting Thorotrast into the cerebral vessels and also into the subarachnoid spaces by lumbar puncture. Many investigators have injected large numbers of peripheral arteries. dos Santos, Hissabin and Caldes have had excellent results in 40 cases. A number of other foreign observers report Thorotrast to be an ideal medium for visualization of the peripheral vessels. In this country Allen and Camp of the Mayo Clinic have found this to be a valuable method for the determination of the condition of the peripheral vessels. They have had favorable results in a large number of cases.

The great value of the visualization of the vascular system needs little emphasis by us. A more accurate knowledge of the condition of the cerebral, pulmonary, and great efferent vessels of the heart will solve many perplexing problems. In the case of vascular disease of the extremities an accurate preoperative determination of the circulation should be made. There have been no accurate or safe methods for determining the state of the peripheral arteries, particularly in the large group of obliterative vascular diseases. It is often important to know in case of occlusion of the main arteries whether the circulation is being carried on by the collateral vessels, or on the other hand whether the peripheral arteries are occluded and the main trunks patent. Many indirect methods have been employed to achieve this end. The condition of the main arteries may be determined to some extent by palpation, by the application of the Pachin oscillometer or by the use of the recording sphygmomanometer. The circulation of the arteries and subpapillary network of vessels may be determined by the appearance of the part, its temperature, its reaction to elevation and dependency, by the return of color after blanching, by the absorption of intradermal saline, or by other similar tests. For the most part these examinations by a competent observer will serve without the use of special tests to distinguish between cases of mild and severe arterial obliteration. But in a considerable number of cases no such differentiation can be made, and even with the use of all available tests there remains a legitimate doubt of the extent of the damage.

Besides determining the condition of the major arterial trunks and the smaller arteries, arteriography and veinography serve as an important adjunct not only in the study of the normal anatomy and physiology of the vessels, but in many other pathological conditions as well. Saito has demonstrated their usefulness in determining the following points: the site of cerebral tumors, changes in the course of arteries in fractures and dislocations, the site of amputation in cases of peripheral gangrene, the location and extent of the collateral circulation after amputation of an extremity, the vascular condition of the extremity in spontaneous gangrene, in tumor of the extremity, and after resection of the knee, the character of venous valves and extent of varices, the location and size of aneurisms of the peripheral arteries. It has been found useful in several cases in differentiating aneurisms of the vessels of the extremities from sarcoma. Undoubtedly there are many other instances in which valuable information might be obtained, e.g., in the study of tumors of bone and soft tissues, in infections of bone and soft tissues, in determining the circulation in ununited fractures, in the study of epiphysitis and many other abnormalities of the bones and joints.

Our series of cases is small and adds nothing toward the perfection of the technic or diagnosis, but it has proved to us that we now have a safe and valuable adjunct for the diagnosis and management of diseases of the blood vessels.

Illustrative Cases

Case 1: The first case examined by us was a man aged 65 years with diabetic gangrene of the toes. Injection was made into the femoral artery after surgical exposure. Radiograms showed complete occlusion high up in the posterior tibial artery (Figure 1). After amputation of the limb and dissection of the artery the occlusion was found to be the result of extreme calcification of the artery with complete absence of lumen. This was the only patient who showed any reaction. Several hours after injection the limb became somewhat swollen and painful and the skin was red, all of which we attribute to surgical manipulation.

Case 2 (Courtesy of Dr. W. M. Yater): The patient was a colored boy 15 years of age with a gun-shot wound of the left elbow which had been sustained some months previously. The heart was enlarged. Examination of the elbow disclosed the presence of a loud bruit and intense thrill over the ulnar surface of the forearm. The brachial artery was injected through the skin by Dr. Yater and the x-ray films disclosed the presence of a small arteriovenous aneurism. Numerous lead shots were also noted in the soft tissues.

Case 3: A man aged 65 years had been getting intravenous injections of Thorotrast for visualization of the liver and spleen. There was no indication for an arteriogram but instead of injecting into the vein the needle was inserted just as easily in the brachial artery and the sub-papillary vascular network of the hand was clearly visualized in detail.

Case 4 (Courtesy of Drs. E. M. McPeak and G. W. Leadbetter): A white man aged 30 years following an injury to his leg developed painful swelling of his foot. Injection was made into the popliteal artery. All of the arteries of the foot and leg were well visualized and showed no evidence of abnormality.

Case 5: An arterial encephalogram on a normal monkey showed the distribution of the cerebral vessels and those of the face, the injection being made into the common carotid artery. It was necessary to kill the monkey after injection because of a severe gash on his neck resulting from a tight chain. We are experimenting further with arterial and cisternal encephalography in monkeys and are well pleased with the results to date.

BIBLIOGRAPHY

Allen, E. V., and Camp, J. D.: Proc. Staff Meet., Mayo Clin., 1932, **7**, 657.

Council on Pharmacy and Chemistry: J. A. M. A., 1932, **99**, 2,183.

Egas Moniz, Pinto, A., and Almeida Lima: Röntgenpraxis, 1932, **4**, 90.

Heuser, C.: Röntgenpraxis, 1932, **21**, 915.

Loehr, W., and Jacobi, W.: Zentralbl. f. Chir., 1932, **27**, 1,651.

Martland, H. S.: The International Press, 1932, **11**, 781.

Pearse, H. E., Jr., and Warren, S. L.: Ann. Surg., 1931, **94**, 1,094.

Podres, A.: Zentralbl. f. Chir., 1898, **25**, 593.

Radt, P.: Gesellsch. f. inn. Med., Kong., 1931, **43**, 443.

Saito, M., Karmikawa, K., and Yanagizawa, H.: Am. J. Surg., 1930, **10**, 5.

dos Santos, R., and Caldas, J.: Med. contemp., 1931, **49**, 234.

Schepelmann, E.: München med. Wchnschr., 1910, **30**, 1,614.

Stobberts, F.: J. belge d'urologie, 1932, **6**.

THE DIAGNOSIS OF DISEASES OF THE LIVER

With Special Reference to Thorotrast Hepatosplenography*

Wallace M. Yater, M.D.

Professor of Medicine, Georgetown University School of Medicine

The diagnosis of diseases of the liver is one of the most difficult fields in internal medicine. Proper diagnosis is essential for treatment and prognosis. Diseases of the liver from a clinical standpoint fall readily into two main groups: those with jaundice and those without jaundice. The former include various forms of acute hepatitis, either infectious or toxic, with acute catarrhal jaundice as the prototype; non-obstructive biliary cirrhosis; obstruction of the common bile duct by stone; biliary cirrhosis the result of obstruction and infection; obstruction of the common bile duct by carcinoma of the head of the pancreas; obstruction of the common bile duct from less common causes, such as carcinoma of the bile duct, carcinoma of the duodenum, pressure on the duct by a tumor outside the duct, and benign stricture of the duct; portal cirrhosis of the liver with jaundice; primary carcinoma of the liver; and idiopathic hemolytic icterus. The latter include Laennec's cirrhosis, syphilitic cirrhosis of the liver and hepar lobatum, metastatic carcinoma of the liver and primary carcinoma of the liver. These lists of diseases indicate the great breadth and complexity of the subject I am undertaking to discuss. A summary of the diagnostic methods in more or less common use will be given, after which a more detailed account will be attempted of the diagnosis of liver disease by means of roentgenography after the intravenous injection of Thorotrast.

---

* Read at the Annual Scientific Assembly of the Society, April 25, 1933.

LIVER DISEASE WITH JAUNDICE

In the ultimate analysis the diagnosis of the cause of jaundice in any case depends more upon the history and course of the disease than upon any laboratory procedure. The age of the patient, his previous history, the mode of onset of the jaundice, the presence and character of pain, the presence of fever, and the events transpiring during the first 2 weeks must all be taken together before one may obtain a worthwhile diagnostic impression.

Laboratory tests do help to a certain extent. For instance, the van den Bergh reaction will tell one whether the jaundice is of hemolytic origin or is due to disease of the liver or obstruction of the main duct. It will tell also, as will the icterus index, the degree of jaundice. The van den Bergh reaction and the icterus index are of value in allowing one to follow the curve of the bilirubinemia. But the most important information it fails to give, namely, the diagnosis between hepatic disease and obstruction of the common bile duct. The hemogram is sometimes of considerable value; for instance, in catarrhal jaundice there is regularly a leukopenia with a relative lymphocytosis, and in cholangitis with jaundice there is usually a leukocytosis. In cases of jaundice the bromsulphalein test is of no specific value, since it will give only the information derived from the van den Bergh reaction and is more complicated. The galactose tolerance test has been receiving considerable attention of late, but we have not obtained a great deal of help from it. At times it may allow one to differentiate between acute hepatitis and obstruction of the common bile duct. Determination of the concentration of urobilin and urobilinogen in the urine has been advocated for the purpose of differentiating jaundice due to liver disease and that due to obstruction of the common bile duct. Although theoretically valuable, in practice one receives little help, since obstruction of the common bile duct is seldom complete. Since the liver has a great deal to do with the metabolism of fat, it has been thought that a determination of the cholesterol, cholesterol esters, lecithin, fatty acids and total lipoids of the blood might be of value in the diagnosis of the cause of jaundice. In diffuse parenchymatous damage of the liver the cholesterol ester values in the blood plasma are sometimes diminished. All of these and other tests less frequently employed are of some value, but their value is not great, and often the results of these tests are confusing.

LIVER DISEASE WITHOUT JAUNDICE

In those diseases of the liver not accompanied by jaundice one is faced with a similar situation. The history and the physical examination are of the greatest importance. Often one can only suspect liver damage. Tests of liver function are not particularly valuable, because they help only late in the course of the disease. At least

70 per cent of the liver must be destroyed before the most popular test, the bromsulphalein test, will indicate liver damage. Other tests are being advocated, such as the bilirubin excretion test of Harrop and the modified dextrose tolerance test of Althausen, but they all have the same objection, that while they indicate advanced liver damage they do not show the cause of the damage.

HEPATOSPLENOGRAPHY

Until recently roentgenography in reference to diseases of the liver has been of little value. But since 1929 a method has been developed, largely by Paul Radt of Berlin, by which visualization of the liver and spleen is easily accomplished. The method consists in the intravenous injection of a stabilized colloidal solution of thorium dioxide* followed by the taking of X-ray films. This metal is readily removed from the blood stream by the reticulo-endothelial cells of the body, and being of high atomic weight and therefore radio-opaque it shows well the architecture of the organs which contain the greatest concentration of these cells. Immediate reactions are negligible, and although the metal is extremely slowly eliminated from the body through the urine, bile and bronchial mucus, untoward remote effects have not been observed. The only questions of harm are the possibility of serious effects from radioactivity of the metal deposited in the tissues or the possibility of the delayed conversion of it to a more strongly radioactive form, such as mesothorium. To date proof of these things has not been obtainable. Our group at the Georgetown University and the Gallinger Municipal Hospitals has employed this method in approximately 100 patients during the past 2 years, and we have not observed serious immediate reactions nor remote ill effects. Nevertheless it is probably wise until these questions are settled to use the method only in patients who are the subjects of some rapidly fatal disease.

TECHNIC

In adults of average size 25 cc. of Thorotrast is administered intravenously on each of 3 successive days. In children the dose is reduced roughly in proportion to the weight. More accurate estimation of dosage on the basis of body weight is apparently unnecessary. In general the density of the roentgen shadows of the liver and spleen depends upon the quantity of the medium administered and the anatomical and functional integrity of the cells that store it. If only the outlines of the liver and spleen are desired the dose may be reduced one half. Fractional doses are used in order to eliminate the shock which might be produced by the injection of too large a dose of foreign material.

Films may be taken after 4 hours following the last injection. On the night before the examination the patient is given the usual evening meal and at bedtime 8 grams of compound licorice powder. On the morning of the examination a cleansing enema is given and the patient is advised to come to the X-ray department without breakfast. Films are taken in both the prone and supine positions on the Potter-Buckey diaphragm. The tube is centered over the ensiform cartilage. The following technic has been used in patients of average physique: 60 K.V.P. at 100 m.a. for $3\frac{1}{2}$ seconds at 25 inch distance. It is well in most individuals to place the film transversely in order to get a good image of the spleen and liver on the same film. A more comprehensive idea of the structural characteristics of the liver and spleen is obtained by making several exposures within a range of 10 K.V. of this dosage. Careful technic is essential in securing films which show details of structural change.

ROENTGEN DIAGNOSIS

In good films the liver should cast a homogeneous shadow of approximately the same density as the spine. The spleen normally has a density slightly less than that of the liver shadow, and about the same as that of the ribs.

The use of this method in cases of acute jaundice has not given much help in diagnosis.

---

* Prepared under the trade name of Thorotrast by the Heyden Chemical Corporation of New York.

Structural changes are not great enough to cause alteration in the reticulo-endothelial system in the liver, and parenchymatous liver damage does not affect these cells much. In cases of prolonged jaundice due to obstruction of the common bile duct there results, however, a dilatation of the large ducts in the liver, and these are shown in the film as indefinite branching, clear areas in the liver shadow. The method shows enlargement of the liver when physical examination is indefinite on this point.

Thorotrast hepatosplenography has its greatest place in the diagnosis of those diseases of the liver which are not regularly associated with jaundice, particularly cirrhosis, syphilis, metastatic carcinoma and primary neoplasia. In Laennec's cirrhosis one of two appearances is presented in the film. Either the liver, which is usually shown to be small, is diffusely mottled, or it is of homogeneous density but very much less dense than normally. The first picture is produced by the liver which has islands of regenerated liver tissue imbedded in dense fibrous tissue. The opaque areas in the film represent the islands of liver tissue with the only reticulo-endothelial elements remaining. The second picture is made from the liver in which there is not such a distinct formation into islands, the fibrous tissue replacement forming a finer meshwork. The result of such a condition is a uniform reduction in the number of reticulo-endothelial cells, so that the density of the liver shadow is not nearly as great as normally. In both types of cirrhosis there is always a moderate splenomegaly.

Syphilitic cirrhosis may resemble Laennec's cirrhosis pathologically so closely that it gives an X-ray appearance indistinguishable from it. But in that type of gummatous syphilis of the liver which results in gross deformity from scarring, hepar lobatum, a distinctive picture results. The liver is seen to be greatly lobulated and deformed, and it is frequently less dense than normally.

Often it is important to know whether metastases are present in the liver or whether an enlargement of the liver is due to them. They can be visualized in practically all cases. Metastatic lesions appear as more or less round, non-opaque, usually multiple areas, surrounded by a halo of increased density. This appearance is due to the fact that cancer tissue does not contain reticulo-endothelial cells. In addition, the spleen is practically never found to be enlarged.

A primary neoplasm is diagnosed when a rounded, non-opaque area is seen without the halo of increased density. In diffuse primary carcinoma the picture resembles closely that of cirrhosis.

Abscesses and cysts in the liver are readily visualized. It is possible that traumatic rupture may be detectable.

I have become very enthusiastic about this new method. It has helped me tremendously in my work and allowed me to make many more positive diagnoses.

Summary

In summary, I shall set down the various points which may be determined by means of Thorotrast hepatosplenography, many of which I have not discussed in this paper: (1) the presence of enlargement of the liver or spleen, (2) decision of the question of whether a mass in the upper abdomen is liver, spleen or something else, (3) the presence of metastases in the liver, (4) the presence of a primary tumor, cyst, or abscess in the liver, (5) in many cases the nature and extent of such intrahepatic diseases as cirrhosis and extensive scarring of the liver from syphilis, (6) the progress of such diseases of the liver, (7) the presence of free fluid in the abdomen, (8) the existence of such lesions of the spleen as tumor, infarct, abscess, fibrosis and leukemia, (9) the existence of rupture of the liver or spleen, (10) the position of the diaphragm, (11) the presence of accessory spleens, and (12) in subacute or chronic cases the presence of obstruction of the common bile duct.

BIBLIOGRAPHY

Radt, P.: Eine Methode zur röntgenologischen Kontrastdarstellung vom Milz und Leber. Klin Wchnschr., 1929, 8, 2,128

Yater, W. M., and Otell, L. S.: The Differential Diagnosis of Diseases of the Liver and Spleen by the Aid of Roentgenography after Intravenous Injection of Thorotrast. Am. J. Roentgenol., 1933, **29**, 172.

SOME OBSERVATIONS AND CONSIDERATIONS OF THE DIAGNOSIS AND TREATMENT OF SURGICAL MASTOIDITIS*

Richard A. Kearny, M.D.
Washington, D. C.

"When is a mastoid operation indicated?" and "How should a mastoid operation be done?" are important questions, which when well answered hold the key to the best treatment of mastoiditis. I shall consider briefly these phases of diagnosis and treatment in connection with the hemorrhagic "mastoid," the coalescent "mastoid," the atypical "mastoid," acute exacerbation of chronic mastoiditis, and finally chronic mastoiditis. I believe this classification is necessary because important factors enter into the surgical treatment of each.

We know that in the hemorrhagic type of mastoiditis, there is a thrombophlebitis of the veins in and about the mastoid area. The temperature is usually high, and sudden changes may occur through blood stream infection: in the joints, in the heart, in the lateral sinus, etc. Upon operation the following picture presents itself: the soft tissues bleed profusely when incised; the cortex has a shaven-beard appearance; the mastoid-cells show no destruction of their bony partitions; a vascular and mucous membrane change is noted; a hemorrhagic and serous exudate fills the mastoid cells; free bleeding occurs throughout the mastoid, and the cell septa are hard. In the operation it is best not to be too thorough in the removal of cell structure, and the dura or lateral sinus should not be exposed unless conditions warrant the exposure. Whether operation is performed early or late, the mastoid always presents characteristic hemorrhagic findings. Cases of this type have been known to go on to resolution, but extreme care in observation has to be enlisted when they are treated conservatively. The hemorrhagic "mastoid" usually requires early operation to prevent complications.

The coalescent type is the commonly observed type of mastoiditis. A variable clinical picture presents itself. Pain and constitutional symptoms may or may not be present. The absence of one or both of these should not delude one into a sense of false security. Fever is marked only in the early stages of the disease and in children. In adults past their middle thirties absence of fever seems to be the rule. The findings at operation depend upon the progress of the case at the time. There occurs a breaking down of the cell septa with the formation of pus. Any type of organism may be found, and the kind of invading organism will have some bearing upon the severity of the mastoiditis. The anatomical structure of the mastoid will determine the extensiveness of the operation, for all diseased cells should be well removed in this type of mastoitidis. Often it is best to expose the dura or the sinus wall, especially if there is any change of the cell structure in those areas. This type of mastoiditis may resolve itself without operation. Therefore, one should wait for resolution or until the inflammation is well walled-off before operating, provided complications do not call for immediate operative interference.

The atypical "mastoid" may represent either one of the two types just described. This type represents, however, those cases which do not show middle-ear involvement or clinical signs pointing toward mastoiditis. These cases are difficult to diagnose; this fact and the anatomical mastoid structure may lead to the frequency of complications. Fortunately, these cases are rare. The operative type of work in these atypical mastoids will depend upon the type of mastoiditis, and the complications if present.

The acute exacerbation of chronic mastoiditis calls for an early operation because of the tendency toward complications. This is due to the acute inflammation in a sclerotic area of bone.

The dangerous type of chronic suppurative middle-ear disease is the one with peripheral perforation. This type has to be watched, for it is in these cases that necrosis of the bone occurs. Further, when perforations are at the upper posterior, peripheral pole of the membrani tympani, the ingrowth of the epithelium from the derma of the external canal favors the development of cholesteatoma, and such a condition is dangerous.

---

* Read before the Society, March 29, 1933.

X-ray films of the mastoids are invaluable. The film in the hemorrhagic type of "mastoid" does not show breaking down of the cell septa, but there is a cloudiness; the coalescent type of mastoid does show breaking down of the cell septa, and here the X-ray study is of greatest usefulness; the sclerotic type of "mastoid" shows an obliteration of the cell structure, and cholesteatoma when present often show up in the X-ray picture; the acute exacerbation of the chronic type presents little of value to go upon; finally, the X-ray picture of the atypical type of "mastoid" may be the main clinical evidence upon which to base our diagnosis.

Laboratory tests act only as aids to clarify the diagnosis. It is wrong to allow laboratory data to outweigh the clinical impression. The blood examination, however, offers much to assist in the diagnosis and in the treatment of mastoid infections, especially since transfusions may be of great value. Spinal punctures are invaluable in the diagnosis of certain complications.

To illustrate the problems in the types of mastoiditis considered, I shall present one case of each type of surgical "mastoid" selected from the list of my surgical "mastoids" performed at Garfield Memorial Hospital and Children's Hospital within the past 10 years. The selected cases, however, were all done at Garfield Memorial Hospital. I believed them to be surgical "mastoids." There was no death among these cases, nor have I had a death from mastoid surgery at either of these institutions during the past 10-year period.

ILLUSTRATIVE CASES

Case 1: Acute hemorrhagic mastoiditis.

M. M., a school-girl aged 9 years, was admitted to Garfield Memorial Hospital, May 11, 1931. The mother had informed me by phone that her daughter had pain in the left ear which started on May 5; the ear drum apparently ruptured, and the pain had eased. She had ear pain, however, the nights of May 6, 7, 8 and 9, but no aural discharge. On May 10 she began to get relief when the aural discharge started again. On May 11 the temperature was 103°F. I was told that she had had a chill at 11 o'clock that morning; she had been nauseated and had vomited; also that she had been having headaches during the previous few days. Whenever the ear started to discharge these would let up. The *X*-ray report of her mastoids stated: "Opacity of the left mastoid cells, the right cells clear." Leukocytes numbered 30,200, per c.mm. of blood with 90 per cent polymorphonuclears. A left mastoidectomy was done the same evening of May 11. I found a shaven-beard appearance of the bone. The cortex was removed and a hemorrhagic "mastoid" was noted. There was no cellular destruction. The entire mastoid was intensely red and bled profusely. Serosanguineous fluid filled the cells. The lateral sinus was exposed for 15 by 6 mm., as was the dura, and both were normal in appearance. Free bleeding occurred throughout the operation. The patient's temperature after rising to 105°F. gradually subsided to normal by lysis on the 4th day following the operation. Her pulse dropped from 130 to 90 during this same period. She made an uninterrupted recovery and was discharged from the hospital, May 27, and was declared fully recovered, June 25, 1931.

COMMENT

The dangerous character of this type of lesion should be kept in mind. The surgical picture was a clear-cut hemorrhagic "mastoid." In these cases it is best not to expose the sinus or dura unless definite indications clinically make it advisable, since this may light up an infection about or within the sinus wall, or in the dura, which otherwise might lie dormant. The only soft cellular condition in this mastoid was found about the sinus and the dura. For this reason the sinus and the dura were exposed. It is in this type of mastoiditis that sinus thrombosis occurs most frequently. I believe that in this case complications were avoided by operating.

Case 2: Bilateral coalescent mastoiditis following scarlet fever, with left facial paralysis and early extradural abscess with meningeal irritation.

W. W., a boy aged 4 years, was admitted to Garfield Memorial Hospital March 16, 1929. On March 10, 1929, he had had scarlet fever although 2 weeks before he had received a prophylactic dose of scarlet fever serum. On March 13, the attending physician administered scarlet fever antitoxin; on March 15, the left ear began to discharge. When admitted he was acutely ill. In the afternoon of March 16 I found the patient in a semicomatose condition. There was a definite paresis of the left facial nerve, apparently peripheral in type. A purulent discharge was coming from both nostrils and both ears; the tongue was covered with ulcers, and the whole mouth and pharynx were acutely inflamed. As the ear drum perforations were insufficient, I did a double paracentesis. Besides the routine examinations required on such cases I requested a neurological. This indicated a "generalized meningeal irritation." The x-ray report of March 18 read, "Bilateral Mastoiditis." A left mastoidectomy was done on March 18. The cortex was found to be thick. There was necrosis of many of the deep cells, and pus with a membranous exudate in the area from the antrum to the tip was present. The bone was soft at the upper part of the mastoid. The lateral sinus was exposed about 18 by 7 mm., but was found to be normal in appearance. Since the patient did not do well during the operation, I thought it best to wait and do the right mastoid later. On March 21, a right mastoidectomy was done. The cortex was thick and presented a shaven-beard appearance. Necrotic cells, pus and a membranous exudate were found. The dura was exposed about 13 by 6 mm., and was found to be very much injected; there was soft bone on the dura at that point. The sinus was exposed about 18 by 6 mm., but it was normal in appearance. The report of the second neurological examination showed, "a subsiding meningeal irritation, no evidence of true meningitis, nor any other true intracranial condition." The patient's pansinusitis and ulcerated tongue were treated and responded well. The patient was discharged from the hospital May 17, 1929. I removed his tonsils and adenoids, June 22, 1929. At that time he was in excellent health and 22 pounds overweight.

COMMENT

This patient had almost arrived at that hopeless stage for operation when even the most radical type of surgery does not make the prognosis any too bright. That was also the attending physician's viewpoint. Operation was absolutely necessary, and it offered the only chance for recovery. The findings and results proved this. Of course, the patient was sent into the hospital very late. I believe that was due to the fact that both the father and the mother of the boy were already in Garfield Hospital Annex with scarlet fever, and neglect occurred somewhere along the line.

Case 3: Acute exacerbation of chronic purulent otitis media, with development of a perilabyrinthitis due to a foreign body.

M. R., a woman aged 56 years, was admitted to Garfield Memorial Hospital on October 25, 1924. Two weeks before she had noticed a right aural discharge. This was preceded by a head cold of several weeks duration. She had had an eczema of the right ear for the past 4 years due to the right aural discharge that had been present off and on during that time. She complained of pain in the right ear, and there was mastoid tenderness. Parietal and occipital headaches began about October 11. Deafness in the right ear seemed total, its duration questionable. Dizziness, with nausea and vomiting, was first noticed October 22. She had been staggering to the right for this same period. Examination, October 25, showed the right external-ear canal closed by the apposition of its walls, and there was an offensive discharge coming from the middle ear. The mastoid was tender on pressure. A spontaneous horizontal nystagmus to the right was marked, and it increased in intensity upon looking to the right. This nystagmus had changed in character and direction when the patient was seen at a later date. Then it was rotary and to the left, the horizontal nystagmus to the right having disappeared. The past-pointing was normal. The x-ray report, October 25, showed a breaking down of a small cluster of fair-sized cells over the area that presented mastoid tenderness; there was sclerosis of a large part of the mastoid. On October 26 all the labyrinthine symptoms had subsided. The hemoglobin was 80 per cent and leukocytes numbered 9,000 with 73 per cent polymorphonuclears. A right mastoidectomy was done, October 27. The cortex was thick and hard like ivory. A few cells were found in various parts of the sclerosed mastoid. Pus was present in those cells posterior to the posterior canal wall. Fair-sized cells over that part of the mastoid were found to be tender on pressure and contained a thick mucoid secretion. The cells around the antrum were soft. The lateral sinus was well forward. It was exposed about 6 by 12 mm., and was found normal in appearance. A piece of match stick 18 mm. long, 4 mm. in thickness at one end and tapering to 3 mm. at the other end was removed from the external canal. This piece of wood was found beyond the constricted external canal, protruding into the middle ear. The usual postoperative care was given. There was a slight rise of temperature for 3 days, less than 100°F. The pulse rate varied then between 80 and 100. The patient was discharged from the hospital, November 10, 1924, and she was discharged from care as recovered, the latter part of November.

COMMENT

This case demonstrates the danger of introducing foreign substances into the external canals for cleaning them. The patient stated she had not used a match to clean her ear for a long time, but she had recently used cotton on the end of a probe to clean it out. This probe no doubt jammed against the match stick that had been in the external canal for some time, and was pushed through the drum into the middle ear. The mastoid had been the seat of a chronic suppuration which produced eburnation of the bone. The eczema was caused from the ear discharge. The perilabyrinthitic irritation was of short duration. The patient's safety in this particular case lay in immediate operation. Conservatism in treatment would undoubtedly have cost her life.

Case 4: Radical mastoid operation for chronic suppurative ear disease with cholesteatoma that had begun to cause a perilabyrinthitis.

T. M. S., a woman aged 39 years, was admitted to Garfield Memorial Hospital, June 16, 1924. She had first come to my office, June 16, 1924. I had seen her 3 times 2 years previously; then she had a chronic suppurating ear dating back to 2 years of age. I understood that on June 2, 1924, dizziness was first noticed and had been constant since. Objects were moving from left to right. She had been having parietal, temporal and occipital headaches during the previous 3 months; these head pains had become worse during the previous 2½ weeks. Attacks of nausea had occurred intermittently for the past 10 days, and she had vomited, June 14. Under these circumstances I immediately had her admitted to the hospital for observation and treatment. The x-ray report of June 17, 1924, stated: "The cells on the right side appear to be normal. On the left side there are no cells. The mastoid area is replaced with dense, ivory-like bone." The blood examination of June 19 showed 11,000 leukocytes; these increased to 15,000 on June 24. On June 25, 1924, a left radical "mastoid" was performed. The mastoid was ivory-like throughout, except for a large cholesteatomatous mass filling the antrum and extending beyond it. This mass was well removed, and the dura was exposed above and posterior to the antrum. A Korner flap was used, and a secondary skin graft was done, July 3. Patient was discharged from the hospital, July 9.

COMMENT

The determinination of cholesteatoma is a positive indication for the radical mastoid operation. The cholesteatoma in this case had absorbed bone beyond the antrum area, and was already pressing on the labyrinth. This patient had been subjected to the labyrinth test, i.e., the chair and the caloric tests; there was no evidence, past or present, of a suppurative labyrinthitis. The radical mastoid operation was indicated and was performed

Case 5: Atypical "mastoid" with lateral sinus thrombosis and complete collapse of the left internal jugular vein.

V. G., a woman aged 39 years, was admitted to Garfield Memorial Hospital, January 20, 1933. She had had a sore throat 1 week prior with a slight fever. At the time of entering hospital she had general malaise and a slight fever, and a mass had developed in the region of the left sternoclavicular junction which caused her a great deal of pain. The cervical glands were enlarged and palpable. These glands on the left side were firm and very tender. The faucial tonsils showed chronic inflammation. There was a tender, fluctuating mass over the sternum. On January 27, about one-half cc. of thick white fluid was aspirated from this mass. I was called in to see the patient, February 1. Both ear drums were normal in appearance, and there was no mastoid tenderness. The faucial tonsils showed evidence of chronic disease and I was unable to find any evidence of disease in her ear, nose, or throat examination to act as a cause for her septic condition. She was then having chills followed by temperature elevations above 104°F. The next day I noticed a definite tenderness over the left occipital bone. This tenderness existed in the bone and in the soft tissues of that region. X-rays of her mastoids showed slight cloudiness only in part of the left mastoid. There was no cellular destruction, and all of the mastoid was not cloudy. On February 5, the patient's condition was steadily becoming worse with chills and fever. The only definite thing to go on at that date was the definite occipital tenderness and the chronically diseased tonsils. The abscess at the upper region of her sternum had subsided. There was neither cervical gland tenderness, nor enlargement in the neck of either side. I was inclined to think very definitely of a lateral sinus thrombosis with a slight mastoid involvement of the left side. On February 6, I performed the following operation: 1. I opened the left mastoid. There were a few hemorrhagic cells noted at the tip, about the sinus and around the antrum, otherwise the mastoid was normal in appearance. The sinus plate was thick and presented nothing abnormal. The lateral sinus was uncovered above the knee down to the bulb. The sinus wall presented a grayish appearance, the normal blue slate color was absent, and on palpation the normal blood thrill was absent. 2. Following this I went after the jugular vein. After the cervical neck incision I immediately encountered the external jugular vein about the size of a normal internal jugular vein. This was ligated. Then I continued my search for the internal jugular vein; after an unusual amount of difficulty I finally located a completely collapsed vein. The patient was not doing so well at that time, so I returned to the mastoid wound and the exposed lateral sinus. 3. My third stage of the operation began. I placed an iodoform gauze plug at the upper end of the sinus to block it off. I incised the lateral sinus and out gushed a dirty milky exudate. The plug was removed from above, but no bleeding occurred. I ran a dull ring curette up toward the torcular in the lateral sinus and removed an extensive clot. After free bleeding occurred I replaced an iodoform plug; iodoform gauze drains were used in the open mastoid wound. The usual mastoid dressing was applied, and citrated blood transfusion was administered before the patient left the operating table. There were no further chills following this operation. Several blood transfusions were administered. On February 15, I thought a beginning localized meningitis was manifest. A neurologist saw the patient the next day, and his impression was that there was a localized meningitis. A left neuroretinitis was noted on February 20. The neurological examination on February 22, stated: "There is definitely less redness and congestion of the optic discs, the ankle clonus of the right side has disappeared, and the mental condition has cleared." That same day the ophthalmologist's report read: "Bilateral optic neuritis, more advanced on the right side." The patient at this writing, March 3, is on the road to recovery. She has, however, a swelling of the scalp on the right side of head due to having knocked her head when she fell out of bed nearly 2 weeks or more ago during the period of her localized meningitis, when she had spells of being irrational.

COMMENT

There is no doubt of this being an atypical "mastoid." The middle ear at no time showed any evidence of involvement. I am inclined to believe that this patient's tonsils were the original source of the whole trouble. The cervical glands became involved as the result of the acute tonsillitis. The left jugular vein became involved from the glandular neck infection. The sternoclavicular joint, the most frequently involved joint in the body, follows a jugular or lateral sinus infection. The abscess might have been secondary to this joint involvement. From the lateral sinus infection the left emissary vein involvement produced the occipital tenderness; the deep bone tenderness might have been from inflammation over the lateral sinus.

When we consider our "mastoids" in such a classification as noted, the diagnosis and treatment are rendered easier, for that border line that lies between the surgical and non-surgical "mastoid" is made clearer.

It is true embarrassment might be our lot when we find patients clear up from a surgical "mastoid" after we have advised a mastoid operation, but 'Mother Nature' has played well by the patient, and no one knows that better than the otologist. This does not justify our waiting too long, for in many instances when the case has long passed that surgical border line, serious complications will frequently stare us in the face, and when they do occur, threadlike chances for recovery exist only with operation.

Often there is a little too much delay in having otologists see ears that begin to cause trouble. This delay has frequently lead to those serious complications which may mean the death of the patient. Early myringotomy insuring good and free drainage is extremely important. This simple procedure alone, done well and done early saves many "mastoids" from becoming surgical "mastoids."

CONCLUSIONS

1. The hemorrhagic "mastoid" requires early operation.

2. The coalescent "mastoid" should not be operated upon early unless complications call for immediate operation. This type of case may often go on to resolution without operation, and when it goes on to be a surgical case, waiting has given it a chance to wall itself off. Too early operation may invite trouble.

3. The atypical "mastoid" is difficult of early diagnosis; the type will determine the treatment required.

4. The acute exacerbation of the chronic "mastoid" has to be watched carefully, and early operation is usually advisable on account of the acute inflammation in the sclerosed area.

5. The chronic "mastoid" with cholesteatoma or bone necrosis requires constant supervision and early operation when the symptoms demand operative interference. These cases call for the radical "mastoid" when operation is indicated.

6. "Mastoid" complications require different methods of treatment, since conservatism and radicalism each play their part in the correct method of treatment. Surgical judgment and care of the highest order are required.

7. Free middle-ear drainage is always important in the care of any "mastoid" case.

8. The simple and the radical "mastoid" operations each have their indications. Exposure of the dura and of the sinus plays an important part in respect to a successful operative outcome. Cell-removal in the mastoid operation enters as a very important factor in the success of the operation. A coalescent type of "mastoid" certainly requires more cell-removal and more frequent exposure of the dura and sinus than does the hemorrhagic type of "mastoid."

Finally, I should like to say that I believe dogmatism plays no part in the proper care of "mastoids." I shall close as I opened with the questions: "When is a mastoid operation indicated?" and "How should a mastoid operation be done?" Those were the questions then, they are now, and always will be to my mind, and probably also to your mind, best answered by the conscientious, well-trained otologist.

BIBLIOGRAPHY

FISHER, L.: Neuro-otological Examination as an Aid in the Management of Acute and Chronic Mastoiditis. Pennsylvania M. J., 1932, 35, 771

PREOPERATIVE AND POSTOPERATIVE MANAGEMENT OF GOITER PATIENTS*

Howard F. Strine, M.D.

Associate Professor of Surgery, Georgetown University School of Medicine

From a surgical standpoint, goiters may be classified simply as follows:

(1) Non-toxic, diffuse
(2) Non-toxic, nodular
(3) Toxic, diffuse (with or without exophthalmus)
(4) Toxic, nodular

Preoperative Management

Comparatively speaking, the preoperative management of non-toxic goiters is not of great importance. A complete general examination to determine the condition of the patient as to operative risk, as well as to determine the presence of coincidental disease, is essential. The B. M. R. is within the normal range. Operation is performed for cosmetic reasons, or for the relief of pressure symptoms, evidenced by respiratory embarrassment, changes in voice or tracheal irritation.

X-ray and Laryngoscopic Examinations: These are of great importance in both toxic and non-toxic goiters in order that operative and postoperative complications may be avoided. An X-ray film of the chest is advisable to determine the presence or absence of a persistent thymus, the location of a substernal goiter, and the degree and direction of any tracheal deflection. A knowledge of the latter is important in order that injury to the trachea or to the recurrent laryngeal nerve may be avoided during operation. It is also anticipatory of the possibility of tracheal collapse when pressure is great.

A laryngoscopic examination should be made in all cases in which there is evidence of involvement of a recurrent laryngeal nerve to determine which side is involved. Possessing this knowledge, the surgeon may, with proper care, avoid injuring the unaffected nerve, an injury to which might cause complete loss of voice. Moreover, should it develop that the voice is permanently damaged due to preoperative pressure, the surgeon, from a medico-legal aspect, would be able to avoid responsibility. Preoperative damage to the recurrent largyneal nerve, although much higher in malignant lesions, exists in about 8 per cent of cases and not infrequently remains permanent.

Toxic goiter patients are abnormally excitable, irritable and suspicious, and dread surgical suggestions. It is only when they become fearful of choking to death, losing their voice, or when life becomes unbearable that they will request operation of their own accord. Considerable tact is required by the surgeon in order that he may secure those essential and vital factors in preoperative management of confidence and coöperation.

Use of Lugol's Solution: The operative mortality has been reduced from an incidence of over 4 per cent to a level with that of appendectomy, 0.5 to 0.8 of 1 per cent, by the proper use of Lugol's solution, improvement in technic of operation, and advancement in methods of anesthesia.

The mortality of diffuse toxic goiter has been reduced from 4.5 to .46 per cent by lowering toxicity in preparing the patient for the operation by the proper use of Lugol's solution. The effect of Lugol's solution is quite temporary, the gland soon becoming iodine-fixed and the drug without value. Its use by physicians for temporary beneficial effects, which is becoming quite prevalent, takes surgical treatment back to the pre-Lugol era by increasing the risk and necessitating the multiple-stage operation.

Toxic diffuse goiters (whether or not exophthalmic symptoms are present) are strikingly benefited by Lugol's solution. About 5 per cent of such patients do not respond. In the toxic adenoma group, Lugol's solution is of no value and is actually contraindicated.

Lugol's solution should be started in 5-drop doses, T. I. D., well diluted in water, or in sarsaparilla to render it tasteless, and should be taken on an empty stomach, at least 15 minutes before meals. If given during the period of gastric digestion it is rendered useless, being changed by the gastric juice before it is absorbed. Occasionally a patient can not tolerate Lugol's solution by mouth, in which case it can be administered by retention enemas, double dosage being administered. When toxic symptoms, nervousness and rapid heart are noticeably increased following a few doses, the drug must be discontinued. If, after a day or two, benefit is noticed, such as quieting of the nervousness and a slowing of the heart rate, the dose may be increased, according to the individual case, to 10 or 15 drops T. I. D.

---

* Read at the Annual Scientific Assembly of the Society, April 26, 1933.

The Basal Metabolic Rate: In hyperthyroidism, although not infallible, the B. M. R. is a good index to the extent of toxicity. In patients under 17 years of age it may be relatively low, and the danger of a postoperative storm great. These patients do not respond well to Lugol's solution. Others may have been taking Lugol's over a long period of time, and if so, the B. M. R. reading is unreliable. Some patients, in spite of all preliminary treatment, persist in a high B. M. R. reading, plus 50 per cent or higher, but, nevertheless, they are usually free from postoperative storms. Generally, a B. M. R. reading greater than plus 50 per cent can, with proper rest, diet, and medication, be sufficiently reduced to justify an operation. Patients over 70 years of age, whose cardiovascular system is badly damaged, those with rheumatic heart disease, damaged myocardium from coronary disease, and angina, and those over 50 years of age with a high B. M. R. extending over a year and rapid loss of weight who fail to improve under rest, diet and medication, are bad risks. Operations should not be performed during acute exacerbations, nor immediately before, or during, the menstrual period. Heart damage due to hyperthyroidism, with fibrillation and extrasystoles are suprisingly good risks if the B. M. R. is below 40, the heart compensated, and the patient under 60 years of age.

X-ray Therapy: I have no grievance against X-ray therapy. It may be proper in the treatment of some toxic goiters. However, the use by a roentgenologist of Lugol's solution, in conjunction with radiation, is to be condemned. A number of patients so treated later require surgical intervention to effect a cure.

Time to Operate: Those patients with a high B. M. R. and rapid loss of weight who do not respond to quiet, rest, sedatives, and a light, meat-free diet, are the ones that give the surgeon anxiety. Here the multiple-stage operation is frequently resorted to in order to lessen the operative risk. The time to operate is when the patient, with or without Lugol's solution, is at the lowest point of toxicity possible to attain, and when he is in the best mental state to undergo the operation. An individual convinced that death will result from operation is a very grave risk.

Choice of Anesthetic: The use of avertin, with tolerance, weight, and age considered, administered by rectum and given in the patient's room and supplemented by ethyline or nitrous-oxide gas, has done wonders in allaying the immediate preoperative irritability and apprehension, and in preventing extreme postoperative restlessness. No preliminary morphine is given but atropine, gr. 1/150, is indicated.

Postoperative Treatment

General Management: Absolute quiet in a cool, shaded, well ventilated room, with an ice bag to the neck and over the heart and no blankets are essential, the object being to lower the over-heated body. Alcohol baths are beneficial. There is practically no danger, through cold or exposure to lung involvement, during the 48-hour postoperative period. After the heat stage has passed, blankets and a warm room are in order. No visitors, relatives included, should be permitted for at least two days or longer. Patients are extremely sensitive to noise, confusion, or talkative, apprehensive relatives or friends. Water is indicated, either as saline, given intravenously or subcutaneously in the more toxic cases, or more frequently by retention, tap-water enemas, 6 ounces every 4 hours. When nausea, if any, has ceased, cracked ice and water by mouth are given. On the second day; nourishment may be administered; as a rule thick or semi-solid preparations can be swallowed most easily. Pantopon or barbital preparations are used for distress or restlessness. Codeine sulphate, $\frac{1}{2}$ grain, hypodermically, is indicated for tracheal irritation or cough.

THE USE OF CALCIUM LACTATE: Tetany occurs in about 2 per cent of all thyroidectomies. It is most common in recurrent operations. The symptoms may vary from mild manifestations of parathyroid deficiency to the severe form ending in death. About 2 years ago, following a thyroidectomy, tetany developed during the night in a patient, and remained unrecognized by the nurse and intern until morning, when the symptoms became alarming. Intravenous administration of calcium lactate promptly cleared the serious situation, and undoubtedly prevented death. For the purpose of preventing the development of tetany in the future, I immediately instituted the practice of administering calcium lactate by mouth or rectum, for a period of from about 1 to 2 weeks in all cases following operation. Patients so treated appear to have a quieter and easier postoperative recovery. It is reasonable to believe that parathyroid function is interfered with to a greater or lesser extent in all thyroidectomies, as the result of trauma and subsequent edema of the surrounding tissues. So far, in my experience, tetany has not appeared in any case in which calcium lactate was used, and, as the drug can do no harm, its use will be continued. It may be given by mouth or rectum, or, when the indication is urgent, by the intravenous route (10 cc. of 10 per cent in ampules), and repeated as necessary, dependent upon the symptoms and amount of blood calcium. Parathyroid extract is believed to be useless in these cases.

TREATMENT OF POSTOPERATIVE COMPLICATIONS: Although postoperative hemorrhage occurs infrequently, when it does, dyspnea, cyanosis and choking spells, indicating tracheal pressure, appear. The wound should be quickly opened and the bleeding vessel secured.

Tetany has been discussed.

Tracheal irritation in varying degrees follows most operations, and, in the presence of infection, it may become severe. The administration of codeine hypodermically and cold applications to the throat will usually allay the condition, but in more severe cases the use of an oxygen tent is most valuable. In such cases the wound should also be freely drained.

Pulmonary embolism is quite rare. Air gaining access to an opened, unsecured, large superficial vein during operation produces air embolism of the lungs. In one of my cases, the lower untied cut end of an external jugular vein, due to the slipping of a clamp, sucked in air during 3 inspirations before it was secured, resulting in death. Pneumonia is rare following thyroidectomy, unless there be recurrent largyngeal nerve injury.

Postoperative hyperthyroidism with its frequently fatal outcome is comparatively rare at the present time. Lugol's solution and modern anesthesia have robbed the diffuse goiter of the dreaded "toxic storm" following thyroidectomy. However, if the practice of using Lugol's solution for treatment, other than for its preoperative and postoperative benefit, becomes general, the surgeon will find his percentage of mortality on the increase. Should a "toxic storm" occur, the body temperature should be lowered as rapidly as possible, fluid intake forced and a milk and molasses enema given to thoroughly evacuate the large intestine. The value of the oxygen tent is not fully appreciated by many surgeons. It has a remarkable effect in quieting the extreme restlessness, rapid heart rate, and lowering the temperature. Many surgeons believe that the use of Lugol's solution should be continued in small doses for a month after operation.

Tracheal collapse in the course of the operation, or following it, is a sudden, tragic phenomenon. It is most likely to happen when tracheal pressure is suddenly removed, as in cases of large substernal goiters, or when the trachea has been angulated. When marked sudden dyspnea and cyanosis appear, the immediate introduction of the tracheotomy tube is necessary to prevent death.

DRAINAGE: I feel that drainage of the thyroid space and skin flap is indicated in all cases of thyroidectomy to lessen postoperative absorption and prevent tracheal pressure. The drain may be removed after a period of from 24 to 48 hours. Later, if secretions appear, they must be allowed to escape, otherwise a low grade infection results with liquification of the subcutaneous fat, adhesions form to the trachea, and the scar line is thinned out and dimpled. Silver skin clips are used with a few dermal stitches to prevent in-rolling of the edges. These are removed on the fourth day.

RECURRENCE: Patients are usually apprehensive as to the probability of recurrence. If properly removed, non-toxic goiters and toxic adenomata should not recur. Of exophthalmic goiters, 3 to 6 per cent will later show hyperthyroidism, through no fault of the surgeon.

Science Series. No. 14

THE ETIOLOGY OF RHEUMATIC FEVER*

A REVIEW OF INVESTIGATIVE WORK ON THE SUBJECT

O. F. HEDLEY, M.D.

Passed Assistant Surgeon, United States Public Health Service

The microbic factor responsible for rheumatic fever is not known. Much evidence has been acquired indicting streptococci, but no conviction has been made. Evidence in favor of the streptococcal theory is as follows:

1. Streptococci have been found in the tissues and blood stream antemortem and postmortem with a fair degree of constancy.
2. Waves of upper respiratory infection associated with hemolytic streptococci may precede the disease.
3. Patients with the disease show an increase in antibodies and exhibit allergic manifestations to streptococci. There is experimental evidence to confirm this.
4. Diseases, such as scarlet fever, associated with streptococci, may initiate rheumatic activity.[1]
5. Lesions have been produced experimentally which are highly suggestive of those found in rheumatic fever.[2, 3, 4, 5]

The streptococcal theory is not proved. The following powerful arguments may be made against it:

1. The results of blood cultures are very discordant and postmortem cultures practically useless. Nearly all of the organisms obtained are normal inhabitants of the respiratory and alimentary tracts.
2. Waves of upper respiratory infection may occur synchronously with, rather than preceding, rheumatic activity, and may be a manifestation of the disease rather than an etiological factor. Some cases occur without evidence of upper respiratory infections.
3. The production of antibodies against and allergy for streptococci, seems to be highly non-specific.
4. The disease has never been satisfactorily produced experimentally. Various workers have claimed to have produced the Aschoff bodies experimentally, but their work has not been generally accepted. The criteria of the production of Aschoff bodies, non-bacterial pericarditis, and non-bacterial verrucous endocarditis have never been satisfied.[6]
5. Much of the laboratory work has been done with organisms obtained from non-rheumatic sources, particularly from infective (subacute bacterial) endocarditis.[7]

Consideration is given certain non-streptococcal theories. Achalme[8] in 1897 and more recently Bertrand[9] and others[10] have claimed that an anaerobic bacillus, obtained either antemortem or postmortem, is the etiologic factor. This organism has been identified as B. perfringens,[7] a common contaminant. Loewenstein has recently claimed that he obtained the bacillus of tuberculosis from blood cultures of rheumatic fever cases.[11] However, in view of his claim that he has obtained these organisms from a number of conditions, none of which have been accepted as tuberculous, little significance can be attached to his work. Filterable viruses have been looked upon with suspicion,[12, 13, 14, 15] but evidence of their relationship is lacking. The rat-flea has been considered a vector,[16] but no proof has been offered.

---

* Read at the Annual Scientific Assembly of the Society, April 26, 1933.

Early bacterial studies were made in a more or less crude manner and contaminations were apparently frequent and unrecognized. Postmortem cultures, now generally in disrepute, were in vogue. Some errors were made because endocarditis was regarded as fulminating rheumatic fever.

The first bacterial studies were made during the last decade of the nineteenth century. In 1900, Poynton and Paine[17] described the Diplococcus rheumaticus. Beattie,[18] and Beaton and Walker[19] calling their organism the Micrococcus rheumaticus, confirmed this work. It was subsequently shown[7] both culturally and experimentally that no single strain had been discovered and that the organisms described were of the salivarius and fecalis groups, commonly found in the pharyngeal and intestinal flora.

In 1913, Rosenow[20] announced the application to rheumatic fever of his theory of the selective affinity of streptococci. He claimed that evidences of that affinity were found in green-producing, hemolytic, and indifferent streptococci, and that the organisms were readily converted from one to the other. His work has not been substantiated.[21]

The more recent work can be divided into four groups: that maintaining that the Streptococcus viridans or alpha type is the dominant factor, that regarding hemolytic or beta organisms as the etiologic agents, that considering indifferent or gamma organisms as the microbic factors, and that favoring the multiple streptococcal hypothesis.

In 1928–29, Cecil and his co-workers[22] obtained positive blood cultures in 35 or 58.3 per cent of 60 rheumatic fever patients. Of these, 33 were alpha, 1 beta, and 1 gamma streptococci. Streptococcus viridans were also found in the cultures of the joint fluids. He considered that the organisms fell into distinct immunological groups, but identified no organism as the etiological factor. He considered that the disease, like gonococcal and infectious arthritides, was due to a direct bacterial invasion of the joints. Bacterial allergy is regarded as playing a part.

Clawson[23, 24, 25] obtained positive cultures, mostly viridans, in 50 of 100 cases. He does not regard the organisms as biologically related. He believes that there is a direct invasion of the tissues, but that there is also an allergic factor, as a result of which the tissues over-react. He has produced experimental evidence to support this, showing that in sensitized rabbits streptococci over-react in the formation of nodules, and that this may be prevented by desensitizing with intravenous injections of streptococcal products.

Gray, Fendrick, and Gowan[26] in a series of 28 rheumatic fever patients obtained positive blood cultures in 20 or 71 per cent. The organisms were of the alpha type in 16 instances.

The organisms isolated by the workers just mentioned are quite similar, if not identical to those found normally in the flora of the throats and intestines. Furthermore, other careful workers, such as Kinsella and Swift,[27] Nye and Seegal,[28] Irvine-Jones,[29] Jordan,[30] and Lynch[31] have been unable to obtain high percentages of organisms in blood cultures in rheumatic fever, some using technic identical with those of Clawson and others. Furthermore, it cannot be shown that these organisms are not adventitious invaders. Grant and Lewis[32] have shown them to be not uncommon in the blood stream of normal individuals.

In 1931, Coburn[33] as a result of routine throat cultures showed that preceding rheumatic activity by about 1–3 weeks, there are waves of hemolytic streptococcal infection of the upper respiratory passages. He considers that rheumatic fever is due to an allergic manifestation in susceptible individuals, caused by hemolytic streptococci. Coburn points out that during the winter and spring months when the disease is more common, the flora of the pharynx becomes predominantly hemolytic. He claims that he is able to predict by routine throat cultures when recrudescences will occur. He has shown that preceding outbreaks among student nurses and in cardiac homes there are waves of hemolytic streptococcal throat infections. In the tropics, where rheumatic fever is uncommon, streptococci are uncommon inhabitants of the upper respiratory tract. Rheumatic fever patients sent to Porto Rico showed no activity while there, but on return to New York they invariably underwent relapses. He states that these organisms fall into 6 immunological groups and that they produce neutrallizable toxins.[34] The nucleoproteins of these organisms are said to produce skin reactions, while those of other streptococci fail to do so, an observation far from confirmed by others. He further claims that rheumatic fever patients show immunological reactions to this group.

There is much to support this work. If for no other reasons than that it emphasizes the relationship of upper respiratory infections to rheumatic fever and the desirability of preventing them in rheumatic subjects, it deserves credit. That there are upper respiratory infections preceding bouts of rheumatic activity followed by a lag period of 7–21 days is not a new observation, and has been confirmed more recently by the experience of Griffith and Glover,[35] Todd,[36] and other English writers. That these infections are accompanied by a hemolytic flora has been noted by Collis[37] and Griffith and Glover. In 1931, Bradley[38] noted that in an epidemic of rheumatic fever in a boys' school in England, hemolytic streptococcal infections preceded the attacks. The streptococci found in this epidemic correspond to 1 of Coburn's 6 groups.

There are still barriers to be hurdled before this theory can gain general acceptance. The contention that the children of the well-to-do do not get rheumatic fever because hemolytic streptococcal infections of the throat are uncommon is not borne out by a lack of other diseases associated with hemolytic streptococci, such as scarlet fever. The claim to any degree of specificity of these organisms based on immunological and allergic reactions needs more amplification, since other workers claim similar results from far different sources. Furthermore, frequently it is not possible to elicit any history of preceding sore throats, and the flora during the disease does not appear to be markedly altered.

In 1927, and subsequently, Small[39, 40] isolated a gamma organism, the Streptococcus cardio-arthritides, from blood cultures of 3 of 116 rheumatic fever patients and from the throats and feces of a number more. Small and Kreidler[41] described this organism as having constant cultural and biological characteristics and claimed that rheumatic fever patients developed agglutinins and opsonins against this organism. He definitely considered it as the etiological factor. In 1928, Lazarus-Barlow, in England, described an organism obtained from the tonsils of rheumatic fever patients, which he and Small regarded as identical with the Streptococcus cardio-arthritides. The work of Small was attended by a wave of hope, soon to be dissipated. Hitchcock,[43] Nye and Seegal,[28] Nabarro and MacDonald,[44] Hill,[45] and subsequently Lazarus-Barlow[46] found that these organisms were as constant in the throats of normal individuals as of rheumatic fever patients.

In 1927, Birkhaug[47] advanced a gamma organism, similar to that described by Small but differing in that it produced a neutrallizable exotoxin. With this exotoxin he claimed to produce skin reactions in active cases of rheumatic fever and stated that it had a high degree of specificity.[48, 49] He also claimed to have induced symptoms of rheumatic fever in himself with this toxin and to have alleviated them with salicylates. Kaiser[50] and Hart[51] substantiated the claims to the specificity of the toxin in cutaneous reaction. Irvine-Jones[29] and some of the workers mentioned above as refuting Small's work, were unable to support his claims.

Thomson[7, 52] in England, has described a gamma organism found in the throats of rheumatic fever patients characterized by forming colonies of definite morphology. He does not regard it as the specific etiologic factor, but looks upon it with suspicion.

The allergic conception, although hinted at by earlier writers,[7, 53] has been brought to the fore by Swift and his co-workers, Derick, Hitchcock, Wilson, Stevens, and others,[54, 55, 56, 57] as well as by Zinsser and his group.[58] According to this hypothesis, as a result of either foci or of multiple infections, allergizing substances consisting of small doses of bacteria or their products are disseminated throughout the body. Consequently the tissues are rendered hypersensitive or allergic to streptococcal products. This allergy is to streptococci in general, and is non-specific. The tissues reach a point where they respond in a maximal manner to minimal stimuli, the result of this response being the clinical condition known as rheumatic fever.

Swift and his co-workers have shown by skin tests and intravenous inoculations that rheumatic fever patients react to streptococci or their products in a non-specific manner. Experimentally, by subcutaneous injections they have been able to produce manifestations of allergy characterized by skin tests, ophthalmic reactions, and lowered lethal doses in rabbits, and have been able to desensitize them by intravenous injections. They are now attempting to desensitize rheumatic fever patients by intravenous vaccines.[59]

The allergic theory is very intriguing in that it obviates the necessity of finding a specific etiologic factor. Moreover, it explains the work of numerous investigators. For example, the products of hemolytic streptococci may be considered as acting as antigens, producing rheumatic fever in previously sensitized individuals but not in others. The organisms found in the blood streams by others may be considered similarly. The theory of specific affinities may be explained in reverse, the tissues and not the organisms having the special affinities.

Summary and Conclusions

Workers in many parts of the world have shown an uncanny, but yet unproven association between streptococci and rheumatic fever. No single organism has been identified as the etiologic agent. If streptococci are involved, it would seem that either numerous organisms are responsible, or that the etiologic factor may assume many types. The latter is doubtful. It may be that workers have described the etiologic agent, but due to rapid attenuation or lack of suitable experimental animals have been unable to confirm their findings.

From the great mass of work which has been done the following conclusions may be drawn:

1. Rheumatic fever is an infectious disease, associated with and probably caused by streptococci.
2. The disease had never been satisfactorily produced in animals.
3. Neither the Diplococcus rheumaticus, Streptococcus cardio-arthritides or any other organism thus far offered as the specific etiologic factor appears likely to be the cause of the disease.
4. The allergic theory, which acts as an omnibus, is the most tenable one at the present time. There is still much to explain as to its mechanism.
5. The relationship between outbreaks of upper respiratory infection due to hemolytic streptococci and rheumatic activity seems to be established. The mechanism is unknown but may be explained on the basis of allergy.

BIBLIOGRAPHY

1. Coombs, C. F.: Rheumatic Heart Disease. New York, William Wood & Co., 1924.
2. Belk, W. P., Jodzis, F. J., and Fendrick, E.: The Lesions in Animals Inoculated With Streptococcus Carido-Arthritides. Arch. Path., 1928, **6**, 812.
3. Clawson, B. J.: Studies on the Etiology of Acute Rheumatic Fever. J. Infect. Dis., 1925, **36**, 444.
4. Clawson, B. J.: Experimental Rheumatoid Myocarditis. Arch. Path., 1926, **2**, 799.
5. Moon, V. H., and Stewart, H. L.: Experimental Rheumatic Lesions in Dogs and Rabbits. Arch. Path., 1931, **11**, 190.
6. Gross, L., Loewe, L., and Eliasoph, B.: Attempts to Reproduce Rheumatic Fever in Animals. J. Exper. Med., 1929, **50**, 41.
7. Annals of the Pickett-Thomson Laboratory. 1928–29, **4**.
8. Achalme, P.: Pathogénie du rhumatisme articulaire aigu. Compt. rend. Soc. de biol., 1897, **4**, 276.
9. Bertrand, L.: Chronic Rheumatism. A Microbic Infection. Bath Conference on Rheumatism, 1928, p. 154.
10. Alexandresco, G., and Lautier, R.: Recherches experimentales sur le rhumatisme. Acta rheumatol., 1931, **3**, 20.

11. Editorial: Tuberculous Bacillemia in Acute Rheumatism. Lancet, 1931, **2**, 140.
12. Schloss, O. M.: The Injection of Rhesus Monkeys with Blood from Patients with Rheumatic Fever. J. A. M. A., 1912, **59**, 1,946.
13. Miller, C. P., Jr.: Attempts to Transmit Rheumatic Fever to Rabbits and Guinea Pigs. J. Exper. Med., 1924, **40**, 525.
14. Miller, C. P., Jr.: Spontaneous Interstitial Myocarditis in Rabbits. J. Exper. Med., 1924, **40**, 543.
15. MacCallum, W. G.: Text-book of Pathology. Phila., W. B. Saunders Co., 1932.
16. Clarke, J. T.: The Geographical and Climatic Distribution of Rheumatic Fever. M. J. & Rec., 1928, **128**, 457.
17. Poynton, F. J., and Paine, A.: The Etiology of Rheumatic Fever. Lancet, 1900, **2**, 861.
18. Beattie, J. M.: The Micrococcus Rheumaticus; Its Cultural and Other Characters. Brit. M. J., 1904, **2**, 1, 510.
19. Beaton, R. M., and Walker, E. W. A.: The Etiology of Acute Rheumatism and Allied Conditions. Brit. M. J., 1903, **1**, 237.
20. Rosenow, E. C.: The Etiology of Acute Rheumatism, Articular and Muscular. J. Infect. Dis., 1914, **14**, 61.
21. Valentine, E., and Van Meter, M.: The Localization of Streptococci in the Tissues of Rabbits. J. Infect. Dis., 1930, **47**, 56.
22. Cecil, R. L., Nicholls, E. E., and Stainsby, W. J.: Bacteriology of the Blood and Joints in Rheumatic Fever. J. Exper. Med., 1929, **50**, 617.
23. Clawson, B. J.: Bacteriology of Acute Rheumatic Fever with Experimental Basis in Animals for Vaccine Therapy. Minnesota Med., 1931, **14**, 1.
24. Clawson, B. J.: Experiments Relative to Possible Basis for Vaccine Therapy in Acute Rheumatic Fever. J. Infect. Dis., 1931, **49**, 90.
25. Clawson, B. J.: Experimental Streptococci Inflammation in Normal, Immune, and Hypersensitive Animals. Arch. Path., 1930, **9**, 1,141.
26. Gray, J. W., Fendrick, E., and Gowen, C. H.: Rheumatic Fever and Rheumatoid Arthritis. Texas State J. Med., 1932, **28**, 203; ibid., 1932, **28**, 317.
27. Kinsella, R. A., and Swift, H. F.: A Classification of Non-hemolytic Streptococci. J. Exper. Med., 1917, **25**, 877.
28. Nye, R. N., and Seegal, D.: Non-hemolytic Streptococci and Acute Rheumatic Fever. J. Exper. Med., 1929, **49**, 539.
29. Irvine-Jones, E. I. M.: Skin Sensitivity of Rheumatic Subjects to Streptococcus Filtrates; Its Relationship to Rheumatic Fever. Arch. Int. Med., 1928, **42**, 784.
30. Jordan, E. P.: The Microbic Etiology of Rheumatic Fever and Arthritis. Arch. Path., 1930, **10**, 79.
31. Lynch, R.: Negative Blood Cultures in Acute Rheumatic Fever. Canad. M. A. J., 1927, **17**, 1,352.
32. Grant, R. T., and Lewis, T.: Observations Relating to Subacute Infective Endocarditis. Heart, 1923, **10**, 21.
33. Coburn, A. F.: The Factor of Infection in the Rheumatic State. Baltimore, Williams & Wilkins Company, 1931.
34. Coburn, A. F., and Pauli, R. H.: Studies on Relationship of Streptococcus Hemolyticus to Rheumatic Process. J. Exper. Med., 1932, **56**, 609.
35. Griffith, F., and Glover, J. R.: Acute Tonsillitis and Some of Its Sequals: Epidemiological and Bacteriological Observations. Brit. M. J., 1931, **2**, 521.
36. Todd, E. W.: Antihaemolysin Titres in Haemolytic Streptococcal Infections and Their Significance in Rheumatic Fever. Brit. J. Exper. Path., 1932, **13**, 248.
37. Collis, W. R. F.: Acute Rheumatism and Haemolytic Streptococci. Lancet, 1931, **1**, 1,341.
38. Bradley, W. H.: Epidemic Acute Rheumatism in a Public School. Quart. J. Med., 1932, **1**, 79.
39. Small, J. C.: Bacterium Causing Rheumatic Fever and Preliminary Account of Therapeutic Action of its Specific Antiserum. Am. J. M. Sc., 1927, **173**, 101.
40. Small, J. C.: Bacteriology of Rheumatic Fever. Bath Conference on Rheumatism, 1928.
41. Kreidler, W. A.: Biologic and Serologic Studies of Streptococcus Cardioarthritides. J. Infect. Dis., 1928, **43**, 415.
42. Lazarus-Barlow, P.: An Investigation into the Cause of Rheumatic Fever in Children. J. Hyg., 1928, **28**, 237.
43. Hitchcock, C. H.: Studies on Indifferent Streptococci; Observations on the Distribution of Indifferent Streptococci in the Throats of Rheumatic and Non-rheumatic Individuals. J. Exper. Med., 1928, **48**, 403.
44. Nabarro, D., and MacDonald, R. A.: Bacteriology of Tonsils in Relationship to Rheumatism in Children. Brit. M. J., 1929, **2**, 758.
45. Hill, N. G.: The Relationship of Streptococcus Cardioarthritides to Acute Rheumatism. Metropolitan Asylum Board Annual Report, London, 1927–29, p. 385.
46. Lazarus-Barlow, P.: Further Investigations Into the Etiology of Acute Rheumatic Fever. Metropolitan Asylum Board Annual Report, London, 1927–29, p. 379.
47. Birkhaug, K. E.: Rheumatic Fever; Bacteriological Studies of a Non-methemoglobin-forming Streptococcus with Special Reference to its Soluble Toxin Production. J. Infect. Dis., 1927, **40**, 549.
48. Birkhaug, K. E.: Rheumatic Fever; Allergic Reactions with a Toxin-producing Strain of the Non-methemoglobin-forming Streptococcus Isolated from Rheumatic Fever. J. Infect. Dis., 1928, **43**, 280.
49. Birkhaug, K. E.: Rheumatic Fever; Skin Hypersensitiveness of Patients with Rheumatic Fever and Chronic Arthritides to Filtrates, Autolysates, and Bacterial Suspensions of Streptococci. J. Infect. Dis., 1929, **44**, 363.
50. Kaiser, A. D.: Skin Reactions in Rheumatic Fever (Birkhaug Test). J. Infect. Dis., 1928, **42**, 25.
51. Hart, A. P.: Results With Birkhaug's Rheumatic Toxin. Canad. M. A. J., 1929, **20**, 159.
52. Thomson, D., and Hill, N. G.: Recent Researches on Streptococcal Etiology of Rheumatic Fever. J. Lab. & Clin. Med., 1930, **15**, 1,124.
53. Poynton, F. J., and Schlesinger, B.: Recent Advances in the Study of Rheumatism. Phila., P. Blakiston's Son & Co., 1931.
54. Swift, H. F., Derick, C. L., and Hitchcock, C. H.: Bacterial Allergy (hyperergy) to Non-hemolytic Streptococci in its Relation to Rheumatic Fever. J. A. M. A., 1928, **90**, 906.

(*Continued on page 175*)

PRENTISS WILLSON, M.D.

President, The Medical Society of the District of Columbia, 1933–1934

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

Editorial Office, 1718 M Street

EDITORIAL STAFF

COURSEN B. CONKLIN, A.M., M.D., *Managing Editor*
WALLACE M. YATER, A.B., M.D., M.S., *Editor*

Committee on Publication

WALLACE M. YATER, A.B., M.D., M.S., Chairman
JAMES W. ESLER, A.B., M.D. C. R. L. HALLEY, A.B., M.D.
F. R. SANDERSON, M.S., M.D. MATTHEW WHITE PERRY, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1933-34

President .... PRENTISS WILLSON, M.D.
1st Vice President .... DANIEL LERAY BORDEN, M.D.
2nd Vice President........ MARGARET M. NICHOLSON, M.D.
Secretary-Treasurer .... COURSEN B. CONKLIN, M.D.

FOREWORD, 1933–34

I am very happy to accede to the request of the Editors of the Annals to say a few words of greeting to the membership of the Society at the beginning of my term as President. I undertake the duties and responsibilities of the ensuing year with a very keen sense of appreciation of the honor which your suffrage has conferred on me, with the firm intention of giving my best to the interests of the Medical Society, but with a full realization not only of my own limitations but of the serious nature of the problems likely to confront us all in the immediate future.

These problems may be divided into two categories: those which we share with the profession of the country as a whole, and those which are peculiar to our own membership. We are all fortunate, in dealing with the present socialistic attack on the profession, in having among our membership men like Drs. Christie, Groover, and others upon whose advice and counsel we must expect to lean heavily. But as a Society, one important contribution we can make toward the solution of the general problems, is to see that our own house is in order, so that the vitally important questions to be passed upon during the next session may receive intelligent and adequate consideration and action.

I believe that a long step in this direction has been taken already in abolishing many of the special committees to permit their reorganization as subcommittees of the Executive Committee. A special meeting of the Executive Committee will be held early in July to effect organization and complete its machinery for handling the business which may come before it. When this is accomplished there will be appropriate subcommittees to which all business may be referred for preliminary study and report to the full committee before it, in turn, takes action looking toward specific recommendations to the Society as a whole. It would seem obvious that this orderly method of procedure can not fail to facilitate the work of this important committee and increase its usefulness to the Society. The proposed amendment to the Constitution increasing the membership of the Committee on Civic Health from 5 to 17 and changing its name to the Committee on Public Health should, in my opinion, be adopted. One of our main reliances in counteracting the present day propaganda against the profession must be sought for in an ability to point to its organized care of public health. The increase in membership of this committee, as proposed, will permit its reorganization into various subcommittees, providing experts to consider and advise upon every phase of this vital subject, and should prove to be of inestimable advantage to the deliberations of the Executive Committee and the actions of the Society.

I earnestly solicit the utmost measure of cooperation and support from each and every member. Without this I can not but fail miserably. It is possibly not too much of an exaggeration to say that, in these times of stress, we must remember to stand together in order that we do not hang separately.

P. W.

OUR PRESIDENT

Dr. Prentiss Willson, 67th President of the Medical Society of the District of Columbia, who took office on July 1, was born in Fredonia, New York, August 2, 1882, the son of Sidney L. and Lucy Staats Willson. He has been a resident of the District of Columbia since 1885. His preliminary education was received in the public schools of Washington, D. C. His diploma was obtained from Central High School in 1900. He entered the College of Physicians and Surgeons, Columbia University, New York City, later graduating from Georgetown University School of Medicine in 1905. During 1905–6 he was on the resident staff at Georgetown University Hospital. For 26 years he taught obstetrics in his Alma Mater, the last 3 years of which time he occupied the chair of Professor of Obstetrics. At present he is Attending Obstetrician at the Columbia Hospital for Women. Upon the organization of the Medical Examining Board under the Healing Arts Practice Act of 1929, he served as an examiner in obstetrics and gynecology.

Dr. Willson became a member of the Medical Society of the District of Columbia on April 3, 1907. During his membership he has served on important committees, notably Business Affairs, Annual Meeting (1929), and on various special committees. He has been chairman of the Committee on Publication, Committee of Censors, Civic Health Committee, and the Executive Committee. His total service on the Executive Committee exceeds 8 years. In addition to his frequent contributions in his specialty to publications in scientific medicine, he has done much constructive work in medical organization. Dr. Willson's term of office, 1933–34, will beyond doubt be marked by much accomplishment in the cause of organized medicine.

PERSONNEL OF COMMITTEES 1933–34

Executive Committee

Elective Members

Edward Y. Davidson
William H. Hough
Wallace M. Yater
Arthur C. Christie
Harry S. Bernton
Janvier W. Lindsay
Jerome F. Crowley
Harry A. Fowler
R. M. LeComte

Ex officio

Prentiss Willson
Henry C. Macatee, *Delegate, A.M.A.*
William J. Stanton
John H. Lyons
A. B. Bennett, *Chairman*
Worth B. Daniels, *Vice Chairman*
Charles R. L. Halley
James W. Esler
George B. Trible
Oscar B. Hunter
D. Percy Hickling
F. O. Coe
C. B. Conklin, *Secretary*

Censors

William J. Stanton, *Chairman*

Grafton Tyler Brown
W. Preston Haynes
Isadore Lattman
E. F. Pickford

Publication

Wallace M. Yater, *Chairman*

James W. Esler
Charles R. L. Halley
Matthew White Perry
Fred R. Sanderson

Public Information

John H. Lyons, *Chairman*

Robert M. Bolton
John Paul Earnest, Jr.
Lewis C. Ecker
Joseph S. Wall

House

A. B. Bennett, *Chairman*

Frank E. Duehring
R. Arthur Hooe
Kate B. Karpeles
Wm. Gerry Morgan

Civic Health

Worth B. Daniels, *Chairman*

James G. Cumming
William H. Hough
Janvier W. Lindsay
W. D. Tewksbury

Program

(Elected by the Society)

Charles R. L. Halley, *Chairman*

Daniel L. Borden
Arch L. Riddick

Medical Defense

(Elected by the Executive Committee)

Sterling Ruffin, *Chairman*

Francis R. Hagner
John B. Nichols
Coursen B. Conklin, *ex officio*

OFFICERS, SCIENTIFIC SECTIONS

Section on Pathology and Laboratory Medicine

Oscar B. Hunter, *Chairman*
Roger M. Choisser, *Vice Chairman*
H. H. Leffler, *Secretary-Treasurer*

Section on Neoplastic Diseases

Frederick O. Coe, *Chairman*
Harry H. Kerr, *Vice Chairman*
Isidore Lattman, *Secretary*
Casimir Leibell,
Truman Abbe, *Program Committee*

OFFICERS 1933–1934

Woman's Auxiliary to the Medical Society of the District of Columbia

President	Mrs. Prentiss Willson
1st Vice-President	Mrs. James A. Gannon
2nd Vice-President	Mrs. Wm. Thornwall Davis
Recording Secretary	Mrs. Arch L. Riddick
Corresponding Secretary	Mrs. Leon A. Martel
Treasurer	Mrs. Albert P. Tibbets
Historian	Mrs. Cyrus W. Culver

DOCTOR MORGAN'S MEMORIAL DAY ADDRESS

On May 30, Dr. William Gerry Morgan, delivered the Memorial Day Address at Newport, New Hampshire. The Doctor decried the modern paternalistic tendencies in government and pointed out through illustrations just how it is now proposed to control not only agricultural pursuits but also manufacturing. Tribute was paid to the newly organized American Veterans' Association. In concluding, quotation was made from the Epic of America by James Truslow Adams: "If the American dream is to come true and to abide with us, it will, at bottom, depend on the people themselves. If we are to achieve a richer and fuller life for all, we have got to know what such an achievement implies. If we are to make the dream come true we must all work together, not to build bigger but to build better. There is a time for quantity and a time for quality. There is a time when quantity becomes a menace and the law of diminishing returns begins to operate, but not so with quality. I mean a genuine individual search and striving for the abiding values of life."

G. W. U. ALUMNI ELECTION

Among the newly elected officers of the General Alumni Association of George Washington University are found the following members of the Medical Society of the District of Columbia: Daniel LeRay Borden, President (Dr. Borden is also Vice-President of the Medical Society), Ella M. A. Enlows, Frederick A. Reuter, Vice-Presidents. Robert McCullough (Dentist), is a Vice-President.

THE ETIOLOGY OF RHEUMATIC FEVER

(*Continued from page 172*)

55. Derick, C. L., Hitchcock, C. H., and Swift, H. F.: Address on the Allergic Conception of Rheumatic Fever. Canad. M. A. J., 1929, **20**, 349.
56. Swift, H. F., Hitchcock, C. H., and Derick, C. L.: General Tuberculin-like Reactions in Rheumatic Fever Patients Following Intravenous Injection of Streptococcus Vaccines or Nucleoproteins. Proc. Soc. Exper. Biol. & Med., 1927–28, **25**, 312.
57. Swift, H. F., and Derick, C. L.: Reactions of Rabbits to Non-hemolytic Streptococci; Skin Reactions in Intravenously Immunized Animals. J. Exper. Med., 1929, **49**, 883.
58. Zinsser, H., and Yu, H.: Bacteriology of Rheumatic Fever and the Allergic Hypothesis. Arch. Int. Med., 1928, **42**, 301.
59. Swift, H. F., Hitchcock, C. H., Derick, C. L., and McEwen, C.: Intravenous Vaccination with Streptococci in Rheumatic Fever. Am. J. M. Sc., **181**, 1.
60. Wilson, M. G., and Swift, H. F.: Intravenous Vaccination with Hemolytic Streptococci; Its Influence on Incidence of Recurrence of Rheumatic Fever in Children. Am. J. Dis. Child., 1931, **42**, 42.

REPRINTS RECEIVED

The following reprints have recently been received for which due acknowledgement is made:

"Intragastric Polypus," American Journal of Surgery, January, 1933, by Daniel L. Borden, M.D.

"Cinematography, Its Use in Surgery," Journal of the Biological Photographic Association, September, 1932, by Daniel L. Borden, M.D.

"Trichophytosis, Including Onychomycosis Universalis, Simulating Tinea Imbricata," Archives of Dermatology and Syphilology, April, 1933, by Herman E. Kittredge, M.D.

"Treatment of Cardiovascular Syphilis. Results Obtained in 53 Patients with Aortic Aneurysm and in 112 with Aortic Regurgitation," Archives of Internal Medicine, June, 1932, by Joseph Earle Moore, M.D., James H. Danglade, M.D., and John C. Reisinger, M.D.

"Diagnosis of Syphilitic Aortitis Uncomplicated by Aortic Regurgitation or Aneurysm. Comparison of Clinical and Necropsy Observations in 105 patients," Archives of Internal Medicine, May, 1932, by Joseph Earle Moore, M.D., James H. Danglade, M.D., and John C. Reisinger, M.D.

"X-ray Treatment of Tonsillar and Lymphoid Tissue," Annals of Otology, Rhinology and Laryngology, December, 1922, by John H. Trinder, M.D.

"A Study of Mesenteric Cysts," Annals of Surgery, September, 1932, by J. Ogle Warfield, Jr., M.D.

"Nasal Accessory Sinusitis," Virginia Medical Monthly, May, 1929, by T. A. Poole, M.D.

MEDICAL WASHINGTON

In Washington as in many other communities there are medical societies with limited membership. Below are tabulated nineteen which are at regular intervals furnishing excellent programs. The ANNALS is always happy to print news items concerning meetings or events in the life of these organizations. A requisite for membership in most is membership in the Medical Society of the District of Columbia. A number of those listed hold their meetings in the Medical Society Building, 1718 M Street. Many give annually a dinner with out-of-town speakers. Last year a few of the societies joined with the Medical Society of the District of Columbia in holding a banquet. May this continue with *one large joint meeting* with banquet each year.

NEW TEACHING FELLOWS

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE

The following full-time teaching fellows in medicine have been appointed for the coming year:

DR. CYRUS M. GORMLEY
DR. PERCY A. BRYANT
DR. WILLIAM C. LAMBERT

The following full-time teaching fellow in surgery has been appointed to replace the retiring fellow:

DR. HENRY WIGDERSON

MEDICAL SOCIETIES WITH LIMITED MEMBERSHIP*

WASHINGTON, D. C.

SOCIETY	PRESIDENT	SECRETARY	REGULAR MEETING
Baltimore-Washington Dermatological	Harry M. Robinson, Baltimore, Md.	M. H. Goodman, Baltimore, Md.	3rd Thursday
Clinical Club	Tomas Cajigas	H. S. Bernton	1st Tuesday
Clinico-Pathological	John W. Burke	Lee McCarthy	1st and 3rd Tuesday
George Washington University	A. B. Bennett	Robert M. Bolton	3rd Saturday
Georgetown Clinical	Joseph F. Elward	J. J. McHale	3rd Tuesday
Hippocrates-Galen	W. C. Stirling	W. M. Ballinger	1st Thursday
International Medical Club	George B. Trible	P. S. Constantinople	†
Jacobi	E. A. Cafritz	David Davis	3rd Thursday
Kober	Arnold McNitt	E. E. Hadley	3rd Monday
Mackall	V. R. Alfaro	W. W. Chase	2nd Tuesday
Medical Arts	G. V. Simpson	Alec A. Preece	2nd Thursday
Medical Review Club	Hugh J. Davis	A. J. Chenery	4th Friday
Osler	J. F. Crowley	J. J. Shugrue	3rd Monday
Pan American D. C. Branch	Hugh S. Cumming	A. A. Moll	Every 3rd month
‡Washington Heart Association	T. A. Claytor	J. W. Esler	Monthly
Washington Medical and Surgical	W. S. Newell	Tomas Cajigas	4th Monday
Washington Society for Mental and Nervous Diseases	J. L. Gilbert	A. M. Duval	3rd Thursday
Washington Society of Pathologists	L. C. Milstead, Allentown, Pa.	V. H. Cornell	1st Saturday
Women's Medical	Edith SeVille Coale	Elizabeth Chickering	1st Tuesday

---

* Acknowledgment is made of the valuable assistance rendered by Dr. Joseph F. Elward in the establishment of this tabulation.

† Called meetings with luncheon usually upon occasion of visiting medical guests from abroad.

‡ Permanent office with lay Secretary, Mrs. Wade Martin, 1315 Nineteenth Street, N. W.

CONTAGIOUS DISEASE REPORT, MAY, 1933

Health Department, District of Columbia

	Morbidity	*Mortality*
Typhoid fever	1	0
Typhus fever	0	0
Smallpox	0	0
Measles	98	1
Scarlet fever	12	2
Whooping cough	34	0
Diphtheria	51	0
Influenza	1	1
Poliomyelitis	0	0
Encephalitis-Lethargica	0	0
Epidemic Cerebrospinal Meningitis	1	0
Tuberculosis (all forms)	86	38
Syphilis	479	5
Gonorrhea	218	0
Chickenpox	100	0
Chancroid	1	0
Pellagra	2	1
Pneumonia (all forms)	82	36

Service *Quality*

KLOMAN INSTRUMENT COMPANY, INC.

WE DO expert Surgical Fittings, and are well equipped, to satisfy both the Doctor and his Patient.

Columbia Medical Building
Room 202

Trademark Registered **STORM** Trademark Registered

Binder and Abdominal Supporter

gives perfect uplift and is worn with comfort and satisfaction. Made of Cotton, Linen or Silk. Washable as underwear. There are three distinct types and many variations of each type.

Picture Shows "Type N"

FOR PTOSIS, HERNIA, PREGNANCY, OBESITY, SACRO-ILIAC RELAXATIONS, HIGH AND LOW OPERATIONS, ETC.

Each Belt Made to Order *Ask for Literature*

KATHERINE L. STORM, M.D.
Originator, Owner and Maker
1701 DIAMOND ST. PHILADELPHIA

For

HIVES

L. A. CULTURE

and

L. A. FORMULA

Not specifics, of course, but so many cases of hives have been controlled by their use that they are well worth a trial.

Send for Samples

NATIONAL VACCINE AND ANTITOXIN INSTITUTE
1515 U Street, N. W., Washington, D. C.
Phone: NORTH 0089

THE MEDICAL ANNALS OF THE DISTRICT OF COLUMBIA is published by the Medical Society of the District of Columbia for the promulgation of information of scientific, general medical and personal interest.

Manuscripts for publication, news items, books for review, and correspondence relating to the editorial management should be sent to either Dr. Coursen B. Conklin or Dr. Wallace M. Yater, Editors, Medical Annals of the District of Columbia, 1718 M Street, N. W., Washington, D. C.

Articles are accepted for publication on condition that they are contributed solely to this journal. Manuscripts must be typewritten, double spaced, and the original copy submitted. Photographs and drawings for illustrations must be carefully marked and show clearly what is intended.

Footnotes and bibliographies should conform to the style of the Quarterly Cumulative Index Medicus, published by the American Medical Association. This requires, in order given: Name of author (last name and initials), exact title of article, name of periodical, with volume, page, month (day of month if weekly), and year. A complete list of abbreviations for standard periodicals, together with a full discussion of the style of the A. M. A. publications, appears in The Art and Practice of Medical Writing, a comprehensive book on the preparation of medical manuscripts, published by the American Medical Association.

Matter appearing in the Annals is covered by copyright but, as a rule, no objection will be made to its reproduction in reputable medical journals, if proper credit is given. However, the reproduction for commercial purposes of articles appearing in The Medical Annals of the District of Columbia will not be permitted.

Reprints may be obtained at cost.

The Medical Annals of the District of Columbia is published monthly. Subscription is included in the annual dues of members. To non-members the annual subscription price is: Domestic $2.00; Canadian $2.25; foreign $2.50, including postage; single copies, twenty-five cents postpaid. Checks, etc., should be made payable to the Medical Society of the District of Columbia.

CLASSIFIED ADVERTISEMENTS

FOR SALE: Home of retired physician located at Berwyn Heights, Md., 9 miles from Washington, D. C.; suitable for REST HOME. Five acres of land, two houses, wonderful shade trees, flowers and shrubbery, all kinds of fruits, city water, electric lights. Property running from street to street; the new Edmonston Road going right by the property. Must see it to appreciate its value. Dr. M. L. Turner, Berwyn Heights, Maryland.

SITUATION WANTED: Graduate nurse with knowledge of typing wishes position in doctor's office. Address: Miss Jane Louise Toepper, 824 Shepherd Street, N. W. Telephone: ADams 3604–J. Reference: Mr. Charles G. Toepper, Surgeon General's Library.

FOR SALE: Packard Automobile. Seven-Passenger Sedan. Custom-built. Cost $4677. Has been driven only 13,000 miles. Guaranteed in perfect condition. Will sell for $1000. Grafton Tyler Brown, M.D., 1801 Eye Street, N. W.

FOR RENT: Physicians Offices—Best Professional Location. High class building and service. Most space for $25, $40, $60, $100, per month. The Parkwood, 1746 K Street, N. W. Apply on premises or 'phone DI. 4620.

WANTED: Copies of INDEX MEDICUS, 1896–97; 1900 to 1902; and 1908. Communicate with the Society's Office.

FOR RENT: Desirable offices, large or small. Washington and Columbia Medical Buildings. Private telephone exchange, twenty-four hour service. Apply to Superintendent, Telephone: National 7200.

FOR SALE: History of the Medical Society of the District of Columbia, 1817–1909. This book is replete with information of your organization's attainments; many biographies are given. Cost: $1.00. Apply Secretary's Office.

POSTGRADUATE COURSE
For Graduates in Medicine
Eye, Ear, Nose and Throat
A house doctor is appointed July 1st and Jan. 1st

LABORATORY COURSE
For Nurses and Graduates of High School
CLASSES LIMITED TO SIX
X-Ray, Basal Metabolism, Electro-cardiography and Physical Therapy

150 clinical patients daily provide material for classes. Positions with attractive salaries in hospitals and with group doctors await qualified Technicians
For particulars regarding either course write
CHICAGO EYE, EAR, NOSE AND THROAT HOSPITAL, 231 West Washington St., Chicago, Illinois

PHYSICIANS' LIABILITY INSURANCE
For further information write or telephone
FRANK R. STRUNK
SUITE 505–512 *Telephone:* National 1160 and 1106 1406 G STREET, N. W.
Under terms of a group policy approved by the Medical Society of the District of Columbia
FIRE - LIFE - AUTOMOBILE - BONDS

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II AUGUST, 1933 NUMBER 8

THE HIGH COST OF STANDARDIZATION*

FREDERICK A. FENNING

Legal Counsel of the Medical Society of the District of Columbia

Individually and collectively, the people of the United States have been "held up." Men have "lost their shirts" and the Government has lost its gold. The highwayman who committed this series of crimes now stands unmasked, and we recognize him as High Cost. While he is being held in restraint by a possé led by no less a citizen than the President of the United States, we seek to throw protection around our remaining possessions and to formulate plans for the recovery of those things which have been filched from us, and it does not salve our indignation or mitigate our resentment when we are forced to admit that the filching was done while we were wide awake. The process by which it was accomplished was painless; the resulting condition is one of extreme pain.

While High Cost was taking our substance, our attention was diverted to various minor costs. In all of these we were feverishly interested. The Congress of the United States conducted prolonged—though ineffective—inquiry into the cost of rent. Cost of living became the subject of active investigation throughout the land. Medical men collected voluminous statistics, pored over figures, argued and debated among themselves, and then gave the public their views on the cost of medical care. The problem of the cost of education was met in part by somewhat reducing charges for tuition and by many communities paying school teachers in scrip of doubtful value.

Where did all this exertion of energy take us? Nowhere. The only thing that it really accomplished was to keep us occupied while High Cost was going through our pockets, and making a very good job of it too.

The full name of High Cost is The High Cost of Standardization. He robs us of more than money, for his policy is to place all of the activities and affairs of life on fixed standards and thus strangle incentive, individuality and independence. His two underlings or henchmen are Paternalism and Propaganda.

Paternalism stretches out the hand of government and loosens the strings of the public purse to direct the birth of infants; to dictate through the reports of conferences and with bureaucratic exactitude the precise manner in which play hours shall be occupied; to bestow financial and sentimental aid on mothers; and, when children attain the work age, Government employment agencies undertake to fit them into jobs. In all of these operations, conducted at ever-mounting cost to the taxpayers, the paramount endeavor is to follow a set and inflexible rule so as to mold every child into the form of the mass. The admonition of Marcus Aurelius, "What is good for the swarm is not good for the bee," is ridiculed as a preachment of ancient days, and in its stead the decree has gone forth that in any given community a thousand children are no longer a thousand separate and distinct entities; they are but units in the standardized group of American juveniles. Raised under such a system, nurtured as it is by liberal pickings from the public treasury, our children grow into manhood and womanhood with a predilection for the beneficient and charitable hand of a paternalistic Government to guide, direct and shelter them in the storms of life. Representative Louis Ludlow, a congressman who is entitled to be rated as a constructive statesman, has pointed out that: "The besetting vice of most of the nostrums that are being urged upon Congress by a vast array of economic reformers is that they would project the Federal Government into businesses and activities which the Federal Government should stay clear of and would saddle into the Federal Treasury charges amounting to untold billions of dollars." The financial expense to the taxpayers running through the years is in staggering figures, but a far greater cost is imposed upon the American people by raising future generations of economic parasites.

---

* Read at the Annual Scientific Assembly of the Society, April 26, 1933.

The majority report of the Committee on the Costs of Medical Care is replete with proposals and schemes for the establishment of groups and agencies of various kinds. It pleads for the hiring of more doctors at public expense, which means the degrading of professionally trained men by making them automatons moving at the caprice of political expediency. This report advances the High Cost of Standardization to the forefront by naïvely proposing that medical care and treatment can be paid for by "the use of taxation." Of course, such a thing can be attempted if our legislators are willing to crush American citizens under the burden of taxes which they cannot meet. Likewise, by taxation, the country can undertake to furnish gasoline. To be sure, not every person in the land uses gasoline, and many who do prefer to use a brand of their own selection. By the same token some persons require little, if any, medical attention; but whether their needs are great or small, the majority of the people like to exercise choice in their medical advisers.

Paternalism has run rampant in squandering public funds in a dozen directions under a guise of patriotism. Men and women with even the minimum of military service have been urged by paid Government employees to enroll for governmental training as bookkeepers, hotel clerks and chiropractors, to let the Government act as their employment agent, to accept medical, surgical and dental service, and legal service of the caliber that can be rendered by clerks, and to live at veterans' hospitals and at soldiers' homes.

In addition to all these gratuities supplied at public expense, billions of dollars are paid out as pensions, compensation and retirement allowances to men who entered the service of the country in time of war ostensibly actuated by patriotic motives. Far in excess of the expense of all these standardized services is the High Cost of Standardization which is imposed upon the recipients, for they must forfeit their individualism and their self-respect.

Paternalistic legislation has dug deep into the public treasury to pay subsidies to shippers and to farmers, assigning as the reason, forsooth, that the individuals engaged in these industries are in need of assistance. On this basis, with equal logic, contributions might properly be made to augment the earnings of horseshoers and the manufacturers of celluloid collars. Physicians would gladly see their 1933 incomes equal those of a few years ago, and to lawyers such a circumstance would be a godsend. But I am persuaded that the men and women of these two ancient and honorable professions will preserve the priceless possession of individuality, and will not consent to being submerged in standardized groups, the standards of which are measured by those of the mediocre members. Neither the Hippocratean oath nor that taken by the sons of Blackstone is administered or subscribed collectively. An individual who takes one of these oaths takes upon himself a very definite personal obligation. So far as in him lies, he is under the duty of striving to maintain high traditions and make his own contributions toward the advancement of his calling. This bounden duty must not be shirked by relegating the potentialities of the individual into the limbo of a standardized conglomeration.

Propaganda has played a conspicuous part in building up the High Cost of Standardization. Organizations that could afford—and those that could ill afford—an executive secretary or a lobbyist have insistently mulcted the public.

The chief qualification for membership, and seemingly the only one, is the ability to pay dues. Sometime ago, newspapers of the national capital noted the proposed formation of a society composed of persons born in one of the local hospitals. With naught in common save that, through no act of their own, they had chanced first to see the light of day under the same roof, these individuals of both sexes, various races, high and low degree, and in all walks of life, were to be banded together in the close fellowship of standardized society.

The clamorous cry of these propagandists is for money. In accordance with the creed of communism, they demand government appropriations under which they, the salaried workers, will, on rule of thumb bases, standardize all the activities of the people. Boldly they seek to standardize philanthropies and charities by preaching the doctrine that the individual has no proper conception of how to apply his own personal contributions for these purposes. Nor is the citizen credited with knowing the amount that he should give. Organized, standardized groups, invariably acting on the urge of hirelings, or at the instance of well-meaning but misguided persons who label themselves "welfare workers," insist on determining how much the individual must contribute, and where and in what proportions it will be distributed. 'Mid the fanfare of trumpets and blatant publicity, the individual hands over the fixed amount to be dispensed by

> "Organized charity, scrimped and iced,
> In the name of a cautious, statistical Christ."

Propagandists know that the mass does not want to think, that it wants its collective brain fed with standardized pap, and that it is willing to lean on a paternalistic government and be led by anyone who holds a self-appointed leadership. As Editor Mencken has put it, "The man of genuine ideas is hedged in by taboos; the quack finds an audience already agape."

The men and women of the Medical Society, whom I have the honor of addressing, belong to a profession that has won its laurels through the achievements of its members working as individuals. In the laboratories, in the class rooms, and in private practice, the disciples of Esculapius have striven to save life, to prolong life, and to alleviate physical and mental distress. They must not lower the banner of modern medicine. It must be held aloft as an incentive to all men to show the courage of individual thought, of individual convictions, and of independent spirit, and as a powerful deterent to the forces which are threatening to bankrupt our independence through the High Cost of Standardization.

THE SINUSES AS FOCI OF INFECTION*

W. H. Jenkins, M.D.

Washington, D. C.

We have grown so accustomed to accepting without question the proposition that purulent infection in any part of the body can, and frequently does, produce inflammation in tissues far removed from the original site, that when we find such large cavities as some of the nasal accessory sinuses filled with large quantities of pus, we are very apt to ascribe to it much more importance than to such relatively insignificant areas as peri-apical dental necrosis, tonsillar infection, etc. The failure to obtain relief, however, in many cases of patients suffering from disorders caused by focal infection by the removal of purulent conditions in the sinuses has produced in the minds of many men the impression that they seldom, if ever, act as foci. There seems much to support this view. For example, take a patient with an acute fulminating suppuration of the maxillary antrum, with marked obstruction to drainage, unbearable pain, and exquisite tenderness over the part. Here there is a large cavity filled with pus under pressure and giving rise to all the local symptoms which such a condition would produce in other parts of the body. But the general reaction is quite different. Unless there is some intercurrent infection, there is most often no appreciable rise in body temperature, no swollen lymphatic glands, and no such general prostration as one

* Read at the Annual Scientific Assembly of the Society, April 25, 1933.

would expect to find. It is true that fever and other signs of absorption do occasionally occur, but they are the exception instead of the rule.

The para-nasal sinuses are bony cavities which are supplied with natural avenues of drainage, and with facilities for evacuating accumulated secretions. The mucous membrane which lines them is in adults extremely thin and contains very few vessels and glands. Recent experiments made on the frontal sinuses of dogs by Childrey and Essex are interesting. The natural openings were blocked off so that the sinus became a closed cavity. Injections of such drugs as nicotine, phenolsulphonephthalein, rattlesnake venom, and histamine were made through the wall. The absorption was found to be very poor in all cases. Although this work was undertaken with the primary object of estimating the danger of injecting highly toxic drugs in the treatment of sinus disease, it was felt that the results might also indicate that toxins from contained purulent material are absorbed in very minute quantities.

If the absorption is so slow from cavities which have been mechanically closed, it should follow that absorption from freely draining cavities would be much less likely to occur. Other experiments reported by Mullin in 1921 designed to map out the route of lymphatic drainage of the maxillary antrum and made by injecting India ink into the cavity brought out the significant fact that the dye was absorbed in only negligible quantities unless it was injected into the substance of the membrane or unless the surface of the mucosa was scarified. These results applied to diseased as well as normal membranes.

On the other hand, the majority of rhinologists believe that absorption from sinuses occurs with frequency comparable to that of the tonsils and teeth and cite many clinical cases to substantiate their view. Numerous reports of cases of arthritis, pyelitis, etc., having been favorably influenced by removal of sinus infection have been made by men of unquestioned sincerity and judgment. Many claim that the so-called "silent sinus," that is, one which is shown by transillumination or X-ray examination to have a much hypertrophied lining membrane but which produces no discharge nor other discomfort commonly associated with sinus disease, is a more frequent source of infection than the frankly purulent type and that in the presence of such a condition complete evisceration of the lining mucosa is imperatively indicated.

Therefore, we have two groups with widely separated opinions. On the one hand there are those who contend that the accessory sinuses are very rarely the source of focal infection and believe that no topical treatment nor surgical operation should be done unless the sinus per se is in need of attention. On the other hand, there are many who heartily recommend the sacrifice of any hypertrophied sinus mucosa when there is any reason to suspect that a focus exists somewhere in the body.

It seems to me that there is a position we might reasonably take which would include the more advantageous tenets of each group. To say that absorption rarely takes place from an infected sinus is, I believe, unjustifiable. Surely there is ample every-day clinical evidence of such a thing happening, particularly with relation to diseases of the eye, of the chest, and of children. One can also reconcile this view with our experimental and physiological data. It has been shown that the mucosa lining the sinuses of children is many times thicker and much more richly supplied with glands and blood vessels than that of the adult. This would explain the fact that in children one so much more often hears of such remote pathology as chorea, valvular heart disease, and kidney infections seemingly having their inception in the sinuses. Again, in adults, if a definite purulent condition be present, it is not unreasonable to suppose that there might be areas of actual ulceration with a consequent disruption of the continuity of membrane, in which circumstances, as has been shown experimentally, absorption readily takes place. Also, if there be present an empyema of the cavity and almost total closure of the ostium with consequent pressure, it may be expected that some absorption of toxic substances will occur even if bacterial absorption does not.

As to the so-called "silent sinus" or symptomless "sinus," I do not believe that it should be dismissed as incapable of causing absorption. Suppose, as sometimes happens, this hypertrophied membrane includes encapsulated infected cysts or small enclosed abscesses. I see no reason why there should not be considerable absorption from such conditions since we know that it does occur readily from the substance of the membrane. Here extreme care is necessary in the diagnosis and we must rely to a great extent upon a careful roentgenological study. While these masses might not appear in the straight plate, if any doubt exists, the diagnosis can often be made by the instillation of an opaque substance into the cavity and noting any filling defect as shown by X-ray films.

In regard to the contention that a simple hypertrophied lining mucosa is a constant menace to the individual, I can only say that I am inclined to agree with Shambaugh's repeated statement that he does not feel that this hypertrophied membrane should be considered more capable of producing infection than that of a chronically hypertrophied turbinate or pharyngeal mucosa.

Turning from this highly controversial field we do find that there are a few conditions which the vast majority of observers believe to be dependent upon the sinuses for their chief source of infection. Their importance entitles them to be discussed under separate headings.

1. INFLAMMATION OF THE PHARYNX AND LARYNX. Chronic inflammation of the posterior pharnygeal wall and larynx is perhaps the most common result of sinus disease. Post-nasal drainage of infected sinus secretions frequently keeps these areas in a state of irritation. One very important consideration here is the production of a dry cough which may keep up for a long period of time and give rise to considerable annoyance and discomfort. It is noticed especially at night and often occasions much loss of sleep.

2. OCULAR DISORDERS. Due to the very intimate anatomical relation between the eye and the nasal cavities, there are many ocular diseases which owe their origin to infected sinuses. Some of these disorders depend to such a large extent upon sinus pathology that it not infrequently happens that unsuspected nasal disease is first discovered as the result of an examination by an alert ophthalmologist.

Sinusitis of a purulent nature may produce secondary foci of inflammation in any part of the eye, and this is most apt to occur when the lesion is in the antrum, ethmoid, or sphenoid. The inflammation is most apt to affect the iris, ciliary body and choroid. Another very interesting occurrence is the production of retrobulbar neuritis by apparently mild hypertrophy involving the region of the sphenoid and posterior ethmoids. This pressure atrophy is brought about by continuity of tissue and at times singularly rapid cures are obtained by aeration of the cells in this region. Direct extension of infection from any of the sinuses may produce orbital edema or cellulitis.

3. PULMONARY DISEASE. During the past few years there has been a growing realization among clinicians that some of the chronic and subacute diseases of the chest are dependent upon chronic and subacute infections of the sinuses. Many internists feel that over 50 per cent of their cases of chronic tracheobronchitis, bronchitis, peribronchitis, and bronchiectasis are caused by some form of sinusitis. It goes without saying that this does not include specific types of lung infection such as tuberculosis, syphilis and pneumonia. Certainly, the number of these cases in which sinusitis is also present is far too great to be a coincidence, and so frequently are the two lesions seen associated that in many sections it is referred to as sinobronchitis.

There are two methods by which the infection from the nose reaches the lungs. The first is by the lymphatics and blood stream. I have already referred to the experiments of Mullin which proved that under favorable conditions infection can be carried through the lymphatics and big veins of the chest into the right side of the heart and so into the pulmonary circulation. I have no doubt that some pulmonary infections do occur in this way, but it seems to me that the more frequent means of transmission must be by the more readily accomplished method of direct inhalation. While we know that the laryngeal cough reflex is constantly alert to guard the lungs from inhalation of foreign material, experiments have proven conclusively that substances resembling sinus discharge can, and frequently do, pass this barrier. I shall cite only one of the many that have been done.

A small piece of tubing was placed in the nostril of a patient at bedtime. During the night while the subject was asleep, iodized oil was gently instilled into the tube so that it slowly passed into the nasopharynx in the manner of sinus discharge. This was done at intervals until 20 cc. had been used. The next morning, X-ray examination of the chest revealed some of the oil along the trachea and in the lower lobe bronchi. This has been repeated by many men in different ways and seems to substantiate the contention that post-nasal drainage is capable of being inhaled and, by this constant feeding of infected material, produce pulmonary infection.

The subject of sino-bronchitis would be incomplete without stressing the importance of such a condition in children. I believe that true sinus infection is much more prevalent in children than one is apt to suppose. The fact that symptoms of sinusitis, such as nasal obstruction, nasal discharge, and frequent colds, are the identical symptoms of hypertrophied adenoids often leads to repeated adenoid operations when the real trouble lies in the sinuses. If, therefore, we admit the close relation of sinusitis and bronchitis, it must follow that this condition is not infrequently met with in children and that treatment of the sinuses should occupy a prominent part in the general therapeutic régime of such a condition in an effort to prevent the development of such permanently disabling sequelae as chronic bronchitis and bronchiectasis later in life.

Conclusions

1. Infection by way of the blood stream from purulent sinusitis probably does not occur with the frequency one would be led to suppose in view of the comparatively large amounts of purulent material and extensive areas of pathology often involved, and purulent sinusitis would seem to occupy a position of less importance than such foci as infected teeth, diseased tonsils, and disordered intestines.

2. Absorption more readily takes place from the sinus mucosa when there are infected cysts or areas of ulceration present, even though none of the classical symptoms of sinusitis be present.

3. There seems to be no doubt that sinusitis is often the etiological factor in certain ocular and pulmonary diseases.

BIBLIOGRAPHY

Anderson, C. M.: Suppuration in Para-nasal Sinuses as Factor in Focal Infection; Review of 400 cases. J. A. M. A., 1930, **94**, 1889.

Childrey, J. H., and Essex, H. E.: Absorption from Mucosa of the Frontal Sinus. Proc. Staff Meet., Mayo Clin., 1931, **6**, 345.

Fineman, S., Snyder, R. G., and Traeger, C. H.: Diagnostic and Therapeutic Measures in Chronic Arthritis. Proc. Staff Meet., Mayo Clin., 1931, **6**, 695.

Hurd, L. M.: The Nasal Accessory Sinuses as Foci of Infection in Chronic Arthritis. Ann. Otol. Rhin. & Laryng., 1933, **42**, 39.

Kistner, F. B.: Chronic Nonpurulent Sinusitis and its Clinical Significance. Ann. Otol. Rhin. & Laryng., 1929, **38**, 795.

McLaurin, J. G.: Chest Complications of Sinus Disease. Ann. Otol. Rhin. & Laryng., 1932, **41**, 780.

Mullin, W. V., and Ryder, C. T.: Studies of the Lymph Drainage of the Accessory Sinuses. Laryngoscope, 1921, **31**, 185.

Quinn, L. H., and Meyer, O. O.: The Relationship of Sinusitis and Bronchiectasis. Arch. Otolaryng., 1929, **10**, 152.

White, L. E.: The Location of the Focus in Optic Nerve Disturbances from Infection. Ann. Otol. Rhin. & Laryng., 1928, **37**, 128.

URINARY VOLUME AND SPECIFIC GRAVITY AS INDICES OF KIDNEY FUNCTION*

H. H. Leffler, M.D.

Pathologist, Gallinger Municipal Hospital, Washington, D. C.

The volume output and specific gravity of urinary specimens have always been available

---

[*] Read at the Annual Scientific Assembly of the Society, April 25, 1933.

for study, but not until recently has an attempt been made to use these factors as a measure of renal function. For several years Dr. Paul Dickens of the Naval Medical School has among others devoted considerable study to these variations, and it is to him that I am indebted for bringing this subject to my attention.

While many tests of renal function have been suggested, the one to be described is easier to perform and gives more information than any single test yet devised. No special test meal is needed, and extensive laboratory procedures are unnecessary. All the laboratory apparatus needed are a measuring glass and a urinometer.

Directions for Performing the Test

1. Pass urine at 7 a.m. and label "control specimen."
2. Drink one quart of water (taking not more than 15 minutes to drink this amount).
3. Take the usual breakfast, but no tea, coffee or milk. (May have a glass of water with breakfast.)
4. Dry mid-day meal (absolutely no fluids).
5. Dry evening meal (absolutely no fluids).
6. Collect urine at exactly 9 a.m., 11 a.m., 9 p.m. and 7 a.m.
7. All urine specimens are collected in separate containers and labeled with the exact time of collecting.
8. In addition to the hours specified above, urine may be voided when desired by the patient, placed in separate container and labeled with the exact time.
9. The test is completed with the collection of the last specimen at 7 a.m. the following morning.
10. Time of voiding, the volume and the specific gravity are now recorded in chart form. (Specific gravity is corrected to 20° centigrade.)

The Normal Kidneys

With a normal kidney the specific gravity should drop after the drinking of water to as low as 1.002 or 1.003, then it gradually returns to a higher concentration until a specific gravity of over 1.025 is reached in the night specimen. Four hours after beginning the test there should be eliminated from 80 to 90 per cent of the water ingested; the night volume should be under 400 cc. and a 24-hour volume of at least 1200 cc. should be obtained. A specific gravity of about 1.027 before starting the test and of about 1.001 of the first specimen after drinking the quart of water demonstrate good concentrating and diluting power. A 4-hour volume of about 976 cc. or 97.6 per cent of the water ingested and a night volume of only 250 cc. shows good flexibility. This may be seen even more strikingly by comparison of the 8 a.m. volume of 303 cc. passed in 1 hour with the 9 p.m. volume of 60 cc. passed in 3 hours. The kidneys of this person can put out either a large or a small volume as occasion demands, and in 24 hours more than the required 1200 cc. of water can be eliminated. A normal record is shown in table 1.

TABLE 1
Normal Kidney Function

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	220	1.027
8 a.m.	303	1.001
8:15 a.m.	153	1.002
8:25 a.m.	140	1.002
9 a.m.	230	1.002
11 a.m.	150	1.011
2 p.m.	110	1.020
4:20 p.m.	125	1.019
6 p.m.	208	1.022
9 p.m.	60	1.023
7 a.m.	250	1.028

	cc.
4-hour volume	976
24-hour volume	1729
Night volume	250

Abnormal Kidneys

Contrast such a kidney with the one giving the result seen in table 2. It is seen at a glance that the concentrating power is entirely lost and the diluting power greatly impaired. Only one specimen of a gravity of 1.004 resulted after the drinking of the water, the remaining specimens returning promptly to a specific gravity near 1.010. It has been found that when a patient cannot concentrate a urinary specimen above 1.010 there is less than 10 per cent of the kidney still functioning. It will also be seen that the 4-hour volume is only 11.1 per cent and that the night volume of 505 cc. is well above the normal. Then, the 24-hour volume of only 889 cc., less than the water ingested, shows that this patient cannot eliminate large quantities of water and that consequently some of it is retained as edema fluid. The hourly volume is also pretty well fixed, there being only a slight variation from hour to hour instead of the marked difference seen in specimens from the normal person. From this table one can see that a very badly damaged kidney has resulted. The patient is edematous and elimination is so poor that uremia is impending, if not already present. This patient before entering the hospital began to lose the sight of both eyes, was becoming deaf, and edema was beginning to show in both her face and ankles. Nausea and vomiting were troublesome, and it was thought that the patient was becoming uremic. A blood urea nitrogen, however, showed only 14 mgm. of urea nitrogen. The concentration-dilution test as given here was then run and the true state of affairs was clearly seen. From the result in table 2, it was predicted that this patient would soon go into coma. She entered the hospital and an attempt was made to relieve the edema by restricting fluids. This caused her to go into a uremic state with urea nitrogen elevated to 77 mgm. Then larger quantities of water were given in spite of the edema, and the blood urea nitrogen dropped to 13 mgm., the patient coming out of coma. Three weeks later she went into the final coma and died.

TABLE 2

TERMINAL GLOMERULONEPHRITIS

No. 84368, F. W., 29, M.

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
8 a.m.	105	1.010
10 a.m.	85	1.004
12 noon	26	1.009
2 p.m.	65	1.009
4 p.m.	68	1.007
6 p.m.	70	1.008
8 p.m.	70	1.007
8 a.m.	505	1.007

	cc.
4-hour volume	111
24-hour volume	889
Night volume	505

In table 3, similar results are shown. This patient was a white man 21 years of age, whose illness began in December, 1931, apparently following a streptococcic tonsillitis. He was in bed at that time for 1 week with swelling of the feet and ankles and puffiness of the face. This recurred with several relapses between that time and his admission to the hospital in 1932 when he showed all the physical symptoms of a failing kidney. The test shows both failure in the concentrating and diluting power, and the fact that only 961 cc. are eliminated in 24 hours would indicate the presence of edema. The prognosis from these findings alone is very poor. The patient continued in much the same condition until June, 1932, when he died in uremia.

TABLE 3

SUBACUTE GLOMERULONEPHRITIS

No. 74737, M. W., 21, S.

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	170	1.007
9 a.m.	100	1.004
11 a.m.	120	1.005
3 p.m.	138	1.009
6 p.m.	80	1.009
7 p.m.	105	1.008
9 p.m.	153	1.008
5 a.m.	165	1.009
7 a.m.	100	1.009

	cc.
4-hour volume	220
24-hour volume	961
Night volume	265

Tables 4 and 5 are from another patient on 2 different admissions and show a different type of renal failure. This patient was a white man 51 years old who entered the hospital with cardiac asthma and a blood pressure of 220 systolic and 150 diastolic. He was found to have generalized arteriosclerosis, and the phenolsulphonephthalein kidney function test showed a badly damaged kidney. However, in table 4, it will be seen that while the concentrating power of the kidney is entirely lost, the diluting power is still present. This would indicate a badly damaged kidney but one which is compensated. In other words, a large volume of low specific gravity can be eliminated, and as long as such a low specific gravity can be maintained the patient will not develop uremic coma. As in the previous 2 cases, it will be seen that this patient has less than 10 per cent of kidney functioning but compensation is still maintained. The very high night volume and the very high 24-hour volume show that the kidney is continuously putting out about the same minute volume of urine. The prognosis from table 4 would be good as long as the patient could eliminate large quantities with a low specific gravity. Under digitalis therapy this patient improved and went home, to return later showing the condition in table 5. From this it is seen that the kidney is no longer able to dilute to any great extent, and consequently uremia is impending. However, the large volume output in the 24 hours has prevented high nitrogen retention. His blood urea nitrogen at this time was 25 mgm. Should the total 24-hour urinary volume drop below 2000 cc. this urea nitrogen would promptly climb to such heights as to place the patient in uremic coma. A few days after this test coma did develop.

TABLE 4

Cardiovascular-Renal Disease

No. 78671, M. W., 51, W.'

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	60	1.012
9 a.m.	108	1.006
4 p.m.	203	1.004
7 p.m.	95	1.004
9 p.m.	200	1.005
11 p.m.	130	1.004
2 a.m.	605	1.004
4 a.m.	330	1.006
5 a.m.	263	1.005
7 a.m.	200	1.004

	cc.
4-hour volume	less than 300
24-hour volume	2134
Night volume	1528

TABLE 5

Cardiovascular-Renal Disease

No. 80920, M. W., 51 W.

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
8 a.m.	200	1.011
10 a.m.	140	1.010
12 noon	200	1.007
2 p.m.	207	1.007
4 p.m.	120	1.010
6 p.m.	95	1.010
8 p.m.	200	1.009
8 a.m.	1100	1.008

	cc.
4-hour volume	340
24-hour volume	2062
Night volume	1100

TABLE 6

Prostatic Obstruction

No. 71702, M. W., 52

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	180	1.010
9 a.m.	235	1.008
11 a.m.	230	1.006
12 noon	250	1.010
3:30 p.m.	450	1.013
5:40 p.m.	250	1.014
7 p.m.	200	1.013
9 p.m.	200	1.014
7 a.m.	450	1.012

	cc.
4-hour volume	465
24-hour volume	2265
Night volume	450

In table 6, a very interesting condition is presented. The patient, a white man 52 years of age, entered the hospital with an acute retention from a hypertrophied prostate. The blood urea nitrogen was 100 mgm., the creatinin 5.5. He was in a uremic condition. An indwelling catheter was used to obtain bladder drainage, but several times it slipped out and a few days later the urea nitrogen was 185 mgm., the creatinin 8.6, and the blood indican 0.5 mgm. Finally, proper bladder drainage was obtained. The patient was given large quantities of water to drink, and the blood urea nitrogen was reduced to 56 mgm., when the test was run as in table 6. It is seen that this patient can concentrate to a specific gravity of 1.014. It has been found that when a patient can concentrate to this point there is at least 20 per cent of kidney still functioning. His diluting power was somewhat impaired. The night volume was above normal, but the 24-hour volume of 2265 cc. was sufficient to prevent uremia. The patient was quite intelligent, and we explained the importance of drinking large quantities of water. With his assistance in this respect the blood urea nitrogen was reduced to a normal figure. When suprapubic cystotomy was done the patient was finally allowed to leave the hospital in a fairly good condition.

TABLE 7

NEPHROSIS

No. 75078, F. C., 18, S.

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	120	1.014
8 a.m.	400	1.003
9 a.m.	360	1.002
10:30 a.m.	450	1.003
11 a.m.	87	1.009
4 p.m.	100	1.023
9 p.m.	75	1.026
7 a.m.	230	1.023

	cc.
4-hour volume	1297
24-hour volume	1822
Night volume	230

A colored girl 18 years of age entered the hospital with facial paralysis and edema of 4 weeks' duration. Urinalysis showed 3 to 6 hyaline casts per low power field and a trace of albumen. The test of urinary function was then performed with results as seen in table 7. The gravity shows both good diluting and concentrating power. The 4-hour volume and the night volume are normal, and the 24-hour volume is well above 1200 cc. From this table it is seen that we have a perfectly normal kidney function. It will be seen that the 4-hour volume is higher than usual, but this can be interpreted as a normal condition, simply showing the extreme flexibility of this patient's kidneys to eliminate huge volumes of fluid in a short space of time. A damaged kidney can never do this. It is thus seen that in spite of the presence of hyaline casts and albumen the kidneys of this patient have an entirely normal function.

TABLE 8

CONGESTIVE HEART FAILURE

No. 74830, F. C., 38

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	60	1.023
9 a.m.	150	1.011
11 a.m.	175	1.008
2 p.m.	110	1.023
7 p.m.	70	1.021
9 p.m.	35	1.021
1 a.m.	235	1.023

	cc.
4-hour volume	325
24-hour volume	625
Night volume	235

In running this test a few extra-renal factors should always be kept in mind. Low specific gravity figures may result if there is insufficient amount of salt and protein in the diet, and the low figures may also be obtained if the patient is excreting edema fluid. Severe anemia will also result in a low specific gravity. If the hemoglobin is below 30 per cent, a picture of impaired renal function will result. Constantly high values are also obtained in pure cardiac failure. Two examples of extra-renal conditions will now be given.

The chart in table 8 represents the result of the test in congestive heart failure. The patient was a colored woman 38 years old, who had had 9 previous admissions to the hospital. Each time she was very edematous, and large quantities of edema fluid were removed from the abdomen repeatedly. It is seen that the diluting power of the kidney is very greatly impaired, but that the concentrating power is fairly well maintained. This is true of all patients with cardiac failure. The volume output is very deficient, and the morning specimen was not obtainable the day following the drinking of the water. The greater part of the ingested water went to make up more edema fluid. On her entrance to the hospital the impression was that she had not only cardiac failure, but also renal failure. This test, however, shows a typical response to a failing heart without kidney involvement. When the patient died the kidneys were found to be very little affected, nephritis not being present. The cause of death was purely cardiac decompensation.

TABLE 9

Anemia

No. 86768, F. C., 30, S.

TIME	VOLUME	SPECIFIC GRAVITY
	cc.	
7 a.m.	110	1.010
9 a.m.	650	1.002
11 a.m.	185	1.005
3 p.m.	375	1.006
4 p.m.	125	1.008
9 p.m.	135	1.010
10 p.m.	100	1.010
11 p.m.	175	1.008
1 a.m.	640	1.005
5 a.m.	320	1.007
7 a.m.	155	1.007

	cc.
4-hour volume	835
24-hour volume	2860
Night volume	1390

In table 9 a picture of failing kidney is seen. The concentrating power is greatly impaired, but the diluting power is fairly good. The night volume is very abnormal, the 4-hour volume about normal, and the 24-hour volume well over the 1200 cc. This patient entered the hospital with a hemoglobin of only 13 per cent and had marked edema. She apparently had acute glomerulonephritis. However, under treatment her anemia cleared up, and when the hemoglobin reached 46 per cent an entirely different test resulted. She could then concentrate the urine to a specific gravity of 1.026, and there was no indication of renal impairment.

Summary

The urinary gravity tests of Volhard, of Mosenthal and of Addis are combined in such a manner as to give one simple and efficient test of kidney function in which the only laboratory apparatus necessary are a graduated measuring glass and a urinometer.

BIBLIOGRAPHY

Boyd, W.: The Pathology of Internal Diseases. Philadelphia, Lea & Febiger, 1931.

Fishberg, A. M.: Hypertension and Nephritis. Philadelphia, Lea & Febiger, 1931.

Nicholson, D.: Laboratory Medicine. Philadelphia, Lea & Febiger, 1930.

THE GASTRO-INTESTINAL SYMPTOM-COMPLEX OF MESENTERIC ARTERIOSCLEROSIS*

Matthew White Perry, M.D.

Clinical Professor of Medicine, Georgetown University School of Medicine

The discomfort and disturbance of function produced by arterial disease are a matter of daily observation. Particularly are symptoms of such origin noted in the heart and in the brain. However, as pointed out by Conner in a recent article relatively few observations concerning the effects of mesenteric arteriosclerosis are recorded. It would seem that arteriosclerosis of the vessels supplying the gastro-intestinal tract should cause certain chronic digestive disturbances, and that it might be possible to so classify symptoms of this origin as to establish a typical symptom-complex. The tendency in gastroenterology is to designate many patients as having functional or nervous indigestion. If it can be shown that chronic indigestion may arise from mesenteric arteriosclerosis, a useful purpose may be served in separating from a large, apparently functional class, a group of patients having a definite organic background for digestive ill health.

---

* Read at the Annual Scientific Assembly of the Society, April 25, 1933.

A chronic symptom-complex, not the acute, severe manifestation called "angina abdominalis," is contemplated. Concerning the latter there is much in the literature (Goodman, Gauss, and Zeek and Phair), but concerning the more chronic manifestations there is surprisingly little (Held). The purpose of this article is to record certain observations relative to this subject as illustrated by several cases.

REPORT OF CASES

Case 1: The patient, examined first, June 1, 1931, was a widower aged 48 years, with no children. His father had died of apoplexy at the age of 51 years. His uncle had died of carcinoma involving the throat, but the exact origin of this was not determined. The patient had had typhoid fever at the age of 18 years. In 1926, he had had malarial fever lasting 10 days. His tonsils had been removed in 1929. He complained of weakness and loss of weight, aching discomfort throughout the abdomen, with at times griping pain in the region of the navel, a tendency to nausea and vomiting, fear of eating and gaseous indigestion. For many years he had regarded himself as having a less stable digestion than the average person. He said that he experienced more gaseous indigestion and more of a tendency to nausea and vomiting and to abdominal heaviness and discomfort after indiscreet eating or after the taking of a heavy meal than did others. These symptoms, however, seem to have been variable and not marked at the time of their origin and for some time subsequent thereto. Four years before, however, he began having definite ill health. At that time he noted, particularly after exercise, and 3 to 4 hours after eating, vague, gnawing, epigastric pain, somewhat relieved by food and soda. This pain did not occur regularly after each meal, but might occur after a meal on a given day and then not for several days. In this irregular way he went on for approximately a year. During the summer of 1928 his duties were light, and in general he enjoyed good health, his epigastric gnawing disappearing. He weighed about 150 pounds during this summer. In September of 1928 he undertook heavy work requiring much study and mental effort. He neglected all outdoor recreation and exercise. He became quite fatigued during this time. In January of 1929, following this strenuous work, he again had a return of irregular abdominal gnawing. It reminded him of that which he had experienced in 1927. This gnawing occurred approximately 4 to 6 times a week. It was temporarily relieved by the taking of food and soda. Along with the already described gnawing, he had considerable nausea and vomiting, and he would often vomit around midnight, frequently bringing up large amounts of food eaten 4 to 6 hours before. At one time he noted blood in the vomitus. This went on until June of 1929, when a gastro-intestinal study was made. No organic lesion was found. Because of his symptoms, however, his physicians prescribed an ambulatory ulcer régime with alkaline powders. Under this scheme he did not appreciably improve. During this interval of time between June of 1929 and January of 1930 the patient's weight remained at approximately 150 pounds. In January of 1930 an x-ray study of the gastro-intestinal tract revealed a gastric ulcer, and at that time an arterial hypertension with a blood pressure of 190 systolic was discovered. Following this examination, he was hospitalized for 6½ months. During this period he went through a Sippy régime for ulcer, but this treatment at no time gave him complete relief. Irregular discomfort persisted in spite of all efforts. He suffered much with gaseous indigestion, a tendency to nausea and vomiting, and abdominal aching. He did not lose weight, however. In March of 1930 he developed looseness of the bowels. This led his physicians to carry out extensive studies of the stools, but at no time were parasitic or bacterial causes of looseness demonstrated. Following his discharge from the hospital he returned to work. The looseness persisted irregularly during the summer and fall of 1930. He began to lose weight, and this continued until he reached the weight of 110 pounds. Irregular looseness alternating with periods of constipation persisted. In November of 1930 an x-ray study was carried out and what was interpreted as a scar of a healed gastric ulcer found. On February 18, 1931, the patient again entered a hospital. At that time he weighed 126 pounds. By this time the symptoms mentioned in the chief complaint had come strikingly into the picture. Although for a number of years he had had symptoms other than those commonly attributed to ulcer, at that time they became quite definite. The character of his digestive disturbance appreciably changed. He no longer had localized epigastric gnawing, but his old tendency to general abdominal aching became quite marked. This continued to come on at about the same time interval after eating as did the original pyrosis. Unlike the original pyrosis, this discomfort was not at all relieved by the taking of food and alkalis. It became so marked that the patient developed a fear of eating. He remained in the hospital until May of 1931. A general study on June 1, 1931, revealed a man markedly under-nourished, weighing 111 pounds, with evidence of thickening of the palpable arteries. Routine study of the heart, lungs, etc., revealed no significant findings. Examination showed the abdomen scaphoid, with normal musculature and fascia. The inguinal rings were normal. The descending colon was easily rolled; it was smooth and spastic, but not tender. The cecum was smooth and not sensitive. No areas of muscle spasm or tenderness could be elicited. No tumor masses could be felt. The liver, spleen and kidneys were not palpable. The prostate gland was moderately increased in size. All other features of the physical examination were negative. Laboratory studies revealed a blood pressure of 108 systolic and 75 diastolic, a trace of albumin in the urine, a negative stool, and a moderate anemia of the secondary type (hemoglobin 75 per cent, erythrocytes 3,740,000). The differential count showed 10,000 leukocytes, with 21 per cent lymphocytes, 1 per cent mononuclears, 70 per cent polymorphonuclears, 2 per cent eosinophiles, and 6 per cent transitionals. The blood Wassermann and Kahn tests were negative. A gastric analysis following an injection of histamine gave the following figures: Fasting specimen: free HCl, 0; total acidity, 14. First specimen after histamine: free HCl, 10; total acidity, 23. Second specimen: free HCl, 16; total acidity, 26. Third specimen: free HCl, 20; total acidity, 30. Fourth specimen: QNS. Fifth specimen: free HCl, 9; total acidity, 20. Sixth specimen: free HCl, 0; total acidity, 13. A gastro-intestinal x-ray examination at this time revealed a small gastric ulcer, very high on the lesser curvature of the stomach. The surrounding zone of the stomach was flexible, and the lesion had the appearance of a simple ulcer. The examination was otherwise negative.

In summary, this case record gave the story of a man who had almost certainly had a gastric ulcer, but who had, in addition, unusual symptoms for an ulcer patient. The problem was to establish whether or not the ulcer was responsible for this unusual picture, or whether some other disease was also operative. This patient had had symptoms suggestive of peptic ulcer, and ulcer had been definitely shown on x-ray examinations, but from the beginning and particularly as time went on, he presented symptoms of a more general type of abdominal discomfort coming on at a rather definite period after eating but unrelieved by those things which commonly give relief from ulcer pain. Along with these symptoms there had come also into the picture looseness of the bowels, fear of eating, marked loss of weight and gaseous indigestion.

While under observation the following occurred: On June 12, 1931, the patient, while sleeping in a reclining chair on his lawn, had his bulldog jump on him. The abdominal muscles were relaxed in sleep, and the force of the dog's weight was sufficient to cause pain. The patient, however, was not shocked, and he walked into his house and upstairs to his bedroom. He was seen on the following afternoon. The abdominal muscles were found rigid, particularly the muscles of the left side of the abdomen. The patient had an accelerated pulse and a temperature of 100°F. It was apparent that he had peritoneal irritation, although the clinical picture at that time was not that of peritonitis. On June 14, the patient was again seen. He had spent a miserable night in spite of having taken 1½ grains of codeine. His temperature at that time was 101°F. and the leukocyte count was 18,600. Gastric lavage by means of a catheter passed through the nose removed 1500 cc. of a very foul liquid, containing upper intestinal contents. On June 17, the patient's condition was appreciably weaker, and his toxemia was profound. On the evening of this day, a small incision in the right lower quadrant was made, and 2 loops of small bowel were exposed. These loops were gangrenous. The operation was done with a tube enterostomy in mind, but the abdomen was closed without this being done. The patient died late in the evening of this day, June 18.

Autopsy, performed June 19, showed a mesenteric thrombosis involving the entire superior mesenteric artery and all of its branches, with gangrene of all of the bowel supplied by the superior mesenteric artery. Marked sclerosis of both superior and inferior mesenteric arteries was demonstrated, and a calcareous plaque surrounding the origin of the superior mesenteric artery was found. This plaque had penetrated the intima and had projected itself into the lumen of the artery. It was thought that the weight of the dog had bent this artery in such a way as to produce this accident, and that the presence of a foreign body in the blood stream had produced the thrombosis. A healed gastric ulcer was found high up on the lesser curvature of the stomach.

COMMENT

The findings in this patient are of interest because of mesenteric thrombosis of unusual origin. They are of greater interest, however, in providing a possible explanation of a type of chronic indigestion frequently observed and as a rule not classified on an organic basis. This patient presented a symptom-complex different from that of simple ulcer. Although he gave a story of ulcer indigestion early in the course of his ill health, at all times the symptoms were not typical, and he later had symptoms quite different from those of ulcer. He then no longer had an epigastric pyrosis, but rather, general abdominal discomfort coming on after eating. His symptoms were those of aching over a broad area of the abdomen, most marked at times in the region of the navel. This discomfort was especially severe after a heavy meal, and in consequence the patient developed a fear of eating. This indigestion was not relieved by the taking of food or alkali. In addition to this aching discomfort occurring at the time of intestinal digestion, and of the inability to take adequate amounts of food, the patient had a tendency to looseness and nausea, and also much intestinal gas. When the autopsy revealed an extensive mesenteric arteriosclerosis, it seemed that in this finding an explanation of the symptoms not fitting into the ulcer syndrome had been demonstrated. Certainly, it seems logical to assume that an extensive mesenteric thickening might produce symptoms at the height of the digestive cycle, when demand for blood flow through the thickened arteries is greatest, just as coronary arterial disease causes heart pain when demand for blood flow is greatest.

Case 2: Briefly stated, another case classified as coming under this category is that of a spinster, aged 70 years. This patient has general arteriosclerosis. Routine study has failed to reveal an organic lesion of the gastro-intestinal tract, or any finding in relation to the other systems adequate as an explanation of her indigestion. She complains of a discomfort 3 to 4 hours after eating, this discomfort consisting of a feeling of heaviness amounting to a distinct soreness and involving the general region of the navel. She speaks of this discomfort as caused by gas. She insists that her symptoms are those of soreness and heaviness, rather than of actual pain. She has found that she must eat very small amounts of food in order to prevent the occurrence of this discomfort. As the result of this, she has not been able to eat adequately for the past 2 years, and in consequence she has lost markedly in weight.

Case 3: A man, aged 73 years, has a marked sclerosis of his palpable arteries, and has long maintained an arterial hypertension. As in case 2, he has no findings in connection with his gastro-intestinal tract or elsewhere sufficient to explain his indigestion. He has never had evidences of congestive or anginal heart failure. He has for several years had attacks of intermittent claudication involving the muscles in his legs. He has general abdominal discomfort if he eats heartily. This discomfort appears at the height of the digestive cycle. He has had much difficulty with gaseous indigestion. He has been annoyed by a combination of these symptoms at night. He tends to awake about midnight with this type of indigestion, and his sleep is much disturbed thereby. He is in the habit of taking his heavy meal in the eve ning.

Summary

Chronic digestive symptoms, apparently originating from sclerosis of the abdominal vessels, may be classified as follows:

1. There is discomfort coming on at the height of the digestive cycle. Due to the occurrence of this symptom at a rather definite time after eating, it at first suggests peptic ulcer, but those things which relieve ulcer discomfort do not relieve this. Its location is different from that of the pyrosis of ulcer. It is more of a general abdominal aching, not a pain localized in the epigastrium.

2. There is inability to eat adequately. This is a very definite symptom. Efforts at upbuilding in these patients fail because they cannot eat liberally.

3. Loss of weight is a feature. This symptom is often marked, in consequence also of the inability of these patients to eat adequately.

4. Less definite symptoms are complained of, such as gaseous indigestion, a tendency to looseness and a tendency to nausea and vomiting. It is thought that these symptoms represent manifestations of lowered gastro-intestinal efficiency.

BIBLIOGRAPHY

Conner, L. A.: Am. J. M. Sc., 1933, **185**, 13.
Gauss, H.: Colorado Med., 1928, **25**, 108.
Goodman, E. H.: Am. J. M. Sc., 1918, **155**, 524.
Held, I. W.: Med. J. & Rec., 1925, **122**, 6.
Zeek, P., and Phair, J. J.: Am. J. M. Sc., 1931, **181**, 548.

THE RATIONAL SURGICAL APPROACH IN PELVIC INFLAMMATIONS*

William J. Cusack, M.D.
Professor of Clinical Gynecology, Georgetown University School of Medicine

I have selected this subject to present because I have had a chance to see, examine and operate on 50 patients that had been previously treated surgically for such inflammatory conditions of the pelvis as double pyosalpinx, hydrosalpinx and chronic tubo-ovarian inflammatory disease. I feel that if these cases had been treated more radically at the time of the first operation it would not have been necessary to do a second one.

The patients presented themselves because of pain and discomfort in the lower abdomen, irregular or disturbed menstruation, and vague digestive disorders. Upon vaginal examination it was found in most instances that the uterus was present together with an ovary, the operator having done a double salpingectomy and oophorectomy. After opening the abdomen it was usually found that the tubes had been removed and one or both ovaries allowed to remain, that the uterus was usually embedded in a mass of omental or intestinal adhesions or was retroverted and fixed in the pelvis, and that the ovary or ovaries had undergone cystic change.

If the proper operation had been done at first, and by that I mean a hysterectomy, with the preservation of an ovary whenever possible, there should have been a cure or at least permanent relief. Allowing the uterus to remain in an inflammatory pelvis from which it has been necessary to remove the tubes is a palliative surgical procedure, and one can never expect or hope that this patient will be entirely well. Unfortunately the surgeon who does the primary operation for an inflammatory disorder of the pelvis rarely sees in many instances the patient when she is suffering, because usually it requires several years for these symptoms and signs to develop. We are all familiar with the fact that patients frequently change their surgeon when secondary operations have to be performed, especially when they have not been relieved or cured by the first operation.

---

* Read at the Annual Scientific Assembly of the Society, April 26, 1933.

Someone may say that the condition of the pelvis may have appeared to be too acute at the time of the first operation, and that if a hysterectomy had been done the patient would have died from shock or from peritonitis. Again, the contention may be made that the patient's general physical condition may not have permitted such an extensive surgical procedure. The competent surgeon never operates, however, upon an acute pelvic condition by the abdominal route. It may be necessary at times to relieve an acute pelvic disorder by the vaginal approach. This should be done when there is an accumulation of pus in the pelvic cul de sac. At times, of course, it may be difficult to determine how acute the pelvic disorder is and what the proper time for operation is. However, if the temperature curve, the abdominal signs and symptoms, and the sedimentation test are observed and interpreted properly they will give helpful information and indicate whether or not the patient is ready for operation. As a rule the patient should be fever-free for at least 2 weeks. After the temperature has been normal for this length of time a vigorous pelvic examination should be made or the patient should be allowed out of bed. If there is any reaction, as shown by an elevation of temperature or a change in the sedimentation rate or by return of the abdominal symptoms, the operation should be postponed. The sedimentation test, which is not only an indicator of the activity of the infection but also indicates the proper time to operate, should be normal. When the acute pelvic process has subsided the abdominal rigidity and tenderness will be diminished or lacking.

I believe that it is a useless procedure to remove the tubes and allow the uterus and ovary or ovaries to remain in the pelvis. In other types of surgery it is not customary to remove part of an infected field when the entire area can be eradicated. This is what the surgeon does when he allows a uterus, with an ovary, to remain in the pelvis that has been subjected to an inflammatory disorder. Why subject a woman for years to a monthly menstrual discomfort when it is non-productive, injurious and dangerous? The loss of blood each month cannot be helpful and it may be injurious, especially if the flow becomes prolonged and profuse. It is dangerous because the uterus in an inflammatory pelvis is a diseased organ and may undergo a degenerative change. Also, the ovary or ovaries which were allowed to remain with the uterus in an inflammatory pelvis may become cystic. If this occurs menstrual disturbances follow even when a hysterectomy has been done. About one-third of the patients operated upon the second time required it because of this menstrual trouble. We know that the internal secretion produced by the ovaries has a regulating effect upon the nervous system, the circulatory system and menstruation. Whenever this secretion is altered or deficient abnormal symptoms and signs referable to both of these systems and menstruation develop.

Since the ovaries are frequently affected in inflammatory disorders of the pelvis great care must be used to preserve the circulation to them. If this is not done a cystic change will develop, and if the uterus is present menstrual disorders and difficulties follow. Therefore, I feel that it is a palliative procedure and unfair to a woman to subject her to this possibility which the surgeon does when he allows the uterus to remain in an inflammatory pelvis after removing the tubes. This patient will be treated later either by the X-ray man or by another surgeon. If the patient does not suffer from vaginal bleeding she complains of lower abdominal pain. The pain is sometimes difficult to explain. However, at the time of operation when one has a chance to observe what has happened since the first operation, it is brought home to him very strongly that the first operation was a palliative one, because frequently the intestines are adherent to the uterus or the uterus is completely covered by adherent bowel. It is possible, I grant, for this to happen even though a hysterectomy had been done at the time of the first operation. However, I feel that the chances for adhesions to form are less if healthy tissue is allowed to remain and not a diseased, inflamed organ, such as the uterus usually is. The backache, bladder disorders and the vague digestive disturbances which occur are probably due to omental and intestinal adhesions.

When the operator finds extensive adhesions he can feel reasonably sure that the first operation was done before the inflammatory disorder had subsided sufficiently. I do not claim that one can prevent adhesions from occurring by removing the uterus together with the tubes for an inflammatory disorder, but I do maintain that if the proper time for operation is chosen, and the proper operation is done, the chances for adhesions to form are less and the chances of restoring the patient to health are greater.

Therefore, I feel that to treat an inflammatory condition of the pelvis properly it is necessary (1) to make a correct diagnosis, (2) to select the proper time for operation, (3) to be sure that the patient is in the best possible physical condition before operation, and (4) to do a curative rather than a palliative operation, i.e., a complete hysterectomy with preservation, of course, whenever possible of an ovary or a portion of an ovary. In conclusion, it should be emphasized that the general condition of the patient should be as fine as possible before operation. Since an inflammatory condition of the pelvis can be treated electively it is the duty of the operator to see that the patient is in the best health possible, especially if he thinks that it is going to be necessary to do an extensive pelvic operation to effect a cure.

ABSTRACTS OF PAPERS READ BEFORE THE SOCIETY

"Surgical Considerations of Carcinoma of the Breast,"* by H. H. Kerr, M.D.

The only 2 known facts about cancer are (a) that it begins as a local disease, and (b) that it has a mortality of 100 per cent unless completely removed. The removal of cancer of the breast by surgery predicates an early diagnosis. Cancer of the breast that has grossly invaded the axilla has probably extended beyond surgical reach and should be considered inoperable. Fifty private cases are reviewed, seen previous to February, 1928. Of these, 9 were considered inoperable and were referred to the radiologist. Eight of the remaining cases were treated elsewhere. Twenty-eight of the 33 cases carefully followed have either been seen personally, or have been heard from within the last couple of months.

Of the 33 cases, 20 are living and well over 5 years after operation. This figure represents a 5-year "cure" of 71.4 per cent. Counting the 5 untraced cases as deaths from cancer the 5-year "cure" would then be 60 per cent. Five patients have died of cancer. Two have died of other causes. Fourteen patients lived over 9 years. There were 2 cases of bilateral cancer of the breast. In 1 a tumor had been removed 20 years before by another surgeon without microscopic confirmation. I removed a cancer of the other breast 7 years ago. In the other bilateral case both breasts had been removed by me, and both lesions had been proved by microscopic examination, 6 and 5 years ago respectively. It is interesting to note that the cancer in 1 breast proved to be scirrhous and in the other an adenocarcinoma. Of the 20 cases only 3 had glands palpable in the axilla before operation, but in another 6 cases glands were found on dissection of the axilla after operation.

The youngest patients, aged 28 and 38 respectively, died within 18 months of operation.

"Personal Reminiscences of Osler, and Remarks on His Contributions to Our Knowledge of Heart Disease,"† by Maude E. Abbott, M.D., Curator, McGill University, Montreal, Canada.

Osler's literary output, as gleaned from a cursory analysis of the classified bibliography‡ of his publica-

(*Continued on page 195*)

---

* Presented May 17, 1933.

† Presented at the Annual Scientific Assembly, April 26, 1933.

‡ Classified and Annotated Bibliography of the publications of Sir William Osler, Bart., F.R.S., etc., Sir William Osler Memorial Volume, edited by Maude E. Abbott, M.D., being Bulletin No. IX of the International Association of Medical Museums, 1st editions, 1926, 2nd edition, 1927, pp. 471–606.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
COURSEN B. CONKLIN, A.M., M.D., *Managing Editor*
WALLACE M. YATER, A.B., M.D., M.S., *Editor*

Committee on Publication
WALLACE M. YATER, A.B., M.D., M.S., Chairman
JAMES W. ESLER, A.B., M.D. C. R. L. HALLEY, A.B., M.D.
F. R. SANDERSON, M.S., M.D. MATTHEW WHITE PERRY, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1933–34
President .... PRENTISS WILLSON, M.D.
1st Vice President .... DANIEL LERAY BORDEN, M.D.
2nd Vice President........ MARGARET M. NICHOLSON, M.D.
Secretary-Treasurer....... COURSEN B. CONKLIN, M.D.

THE LIVES AND WORKS OF MEDICAL MEN IN THE DISTRICT OF COLUMBIA

HISTORICAL IMPORTANCE

The Medical Society of the District of Columbia has many proud traditions, not the least of which are the lives and activities, during the almost century-and-a-quarter of its existence, of members who are now deceased. In the seat of the national government men of great minds in the medical profession have had a lasting influence, not only on the medical developments of our country, but upon the national and local civic life. Members of the Society have been the family physicians of presidents and statesmen of note. Of particular interest has been the intimate relationship that our organization has borne to the American Medical Association. To the original meeting for the organization of the American Medical Association, which took place in Philadelphia in 1847, three delegates were sent. At the end of a decade the national medical organization met in Washington. Dr. Harvey Lindsly, an incorporator of the Society, was elected president. His address was most prophetic of the later grandeur of the nation's capital, at that time hardly more than an overgrown village whose streets were but quagmires. The Society was represented at meetings of the American Medical Association annually. In 1874 the activities of Joseph Meredith Toner were nationally recognized. He was elected president of the American Medical Association. Dr. Toner, who lived from 1825 to 1896, did much for medical Washington. He was a founder of Providence Hospital and served on many committees of the Society. He was an honorary member of the New York and California State Medical Societies. The national medical body will always memorialize him through his introduction of a resolution in 1868 which brought about the formation of the library of the American Medical Association in Chicago, today an institution of many volumes with a lending system reaching physicians in all communities of the country. It was his personal hobby to gather medical publications. He had a personal collection of over 1,000 treatises published before 1800. The years 1882–1883 found Alexander Yelverton Peyton Garnett (1820–1888) the president of the American Medical Association. Dr. Garnett chose sides with his native state, Virginia, during the days of the southern confederacy, becoming physician to President Jefferson Davis and to the families of most of the members of his cabinet. He later was clinical professor and professor of the practice of medicine of Columbian University.* There are many citations that may be made in establishing the intimate relationship of medical Washington and the physicians in the 10-square-mile area of the District with the national life of our country. James Crowdhill Hall, 1805–1880, an incorporator of the Society under the second charter, 1830–1839 professor of surgery at Columbian University Medical School,* was the family physician of every president of the United States from Jackson to Lincoln. For many years he was reputed to have attended the families of the Justices of the Supreme Court and the more prominent of the Senators and members of the House of Representatives. In Georgetown, in the early days of the 19th century, lived Dr. Edward Gantt. Vaccine lymph brought to Washington for the first time by President Thomas Jefferson was used by this doctor and was distributed for use among his colleagues. Although this antedated the organization of the Medical Society of the District of Columbia, it plainly shows, from location in the nation's capital, medical Washington has always had peculiar advantages. A human interest story from the White House as told by the attending physician is as follows: During President Andrew Jackson's term of office a male servant contracted smallpox. All deserted except the man's master. The president himself nursed the stricken man to health. Alexander McWilliams, 1775–1850, a cultured gentleman, was not only a skilled physician but had other avocations, botany and ornithology, in which he excelled. This man is generally recognized as the first to use adhesive plaster in the extension of limbs to bring about proper union of fractures. Of note was Frederick May, 1773–1847, who was president of the Medical Society of the District of Columbia for 15 years, dying of cholera while physician to a special hospital for treatment of this disease, during his 16th term in the presidency. A framed portrait of his son, John Frederick May, a prominent surgeon and a member of the Medical Society of the District of Columbia, now hangs on the walls of the Executive Committee room. Finally, reference must be made in an article of this kind of the life and work of Samuel Clagett Busey, 1828–1901, an author, a humanitarian and above all a physician with national reputation. Busey's Reminiscences, Pictures of the City of Washington, etc., are authoritative. As professor of theory and practice of medicine, Georgetown University, as President of the Medical Society of the District of Columbia for 7 terms,† as a founder of the American Pediatric Society, a founder of the Association of American Physicians, a founder of the American Gynecological Society, etc., he is outstanding and worthy of much, in the Society's final appraisal of its distinguished members.

---

* Now George Washington University.

The Annals has previously published certain historical notes,‡ others should follow. Knowledge with appropriate recognition of the attainments of its members cannot fail to aid in developing a righteous pride and a fine esprit de corps. Articles in the Society's publication, oil paintings of distinguished members on the walls of our meeting rooms, will serve this purpose well. Now in our library hangs an enlarged replica of the original charter signed by President James Munroe. What more fitting than to hang portraits adjacent thereto? The Society now possesses oil paintings, excellent likenesses of members who have accomplished much. May we be able to add at no late date portraits of some named in this article.

EXECUTIVE COMMITTEE

Newly announced appointments to subcommittees by the Chairman, Dr. A. B. Bennett, follow:

Bequests

Harry A. Fowler, *Chairman*
Prentiss Willson
William H. Hough

Budget

Arthur C. Christie, *Chairman*
Oscar B. Hunter
Henry C. Macatee

Business Affairs

Harry S. Bernton, *Chairman*
Jerome F. Crowley
George B. Trible

Davidson Lecturer, Selection of

William H. Hough, *Chairman*
Prentiss Willson
C. R. L. Halley

---

† A proper requisite to gain membership should be the reading of his Presidential Addresses.

‡ Elisha Cullen Dick, 1932, **1**, 281; Thomas Antisell, 1933, **2**, 67; William S. Thornton, "Bulletin," 1931, **8**, 137.

Legislative

Henry C. Macatee, *Chairman*
Worth B. Daniels
D. Percy Hickling

Library

Referred to House Committee

Medical Annals, Selection of Editor

Wallace M. Yater, *Chairman*
C. B. Conklin
Henry C. Macatee

Abuse of Medical Charity and Compensation Clinics

Ralph M. LeComte, *Chairman*
James W. Esler
Fred O. Coe

Membership

Matters pertaining to membership to be referred to the Secretary's Office with instruction to send to each new licentiate, and others, who will probably be acceptable to the Society, an application blank for membership.

Reference

Coursen B. Conklin, *Chairman*
Prentiss Willson
A. B. Bennett

The Executive Committee meets regularly on the second Monday preceding the first Wednesday of every month, October to May, inclusive. Special meetings are held on call.

LOUDON COUNTY MEDICAL SOCIETY

The Loudon County Medical Society met at the home of Dr. W. O. Bailey at Aldie, Virginia, on July 19, 1933. Dr. Harry Gibson of Leesburg was reëlected President and Dr. W. O. Bailey, Secretary-Treasurer.

HEALING ARTS PRACTICE ACT OF FEBRUARY 27, 1929

Were you licensed under the Medical Practice Act of 1896? Have you obtained your new license under the new act? If not, read excerpt of law:

Section 24—"Every person licensed to practice medicine and surgery . . . . under the provisions of an Act . . . . approved June 3, 1896, who desires to continue so to practice . . . . shall apply for a license so to do. . . . . *five years* after the approval of this Act the commission shall issue *no* license to practice the healing art in the District of Columbia on the basis of a license to practice medicine and surgery or to practice midwifery, in the District of Columbia, in force on the date of its approval. . . . ."

PROFESSOR OF SURGERY, GEORGETOWN UNIVERSITY

Dr. James A. Cahill, Jr., succeeds Dr. George Tully Vaughan as professor of surgery at Georgetown University, Dr. Vaughan being appointed professor emeritus. Dr. Cahill is chief of surgery at the Georgetown University and Providence Hospitals.

ABSTRACTS OF PAPERS READ BEFORE THE SOCIETY

(*Continued from page 192*)

tions, reaches the very high figure of some 1,430 items. Of these, 420 are important published articles, mostly addresses on special occasions or before societies, nearly all of which are fundamental contributions to the subject treated, and 30 others are monographs in standard systems of medicine; 101 are short original articles appearing under the captions "Notes and Comments," "Ephemerides," "Men and Books," etc.; 193 are editorials, book reviews or book introductions; 279 are reports of autopsies or pathological specimens presented at societies during his early Canadian and Philadelphia periods; and 91 are case reports. Other items include reports of addresses otherwise unpublished, remarks in discussions, obituary appreciations, published correspondence, reports of societies or commissions, etc. In addition, he has to his credit on this list, no less than 42 books or volumes, written or edited by himself, a figure which includes the 9 successive editions and 4 translations into foreign texts of his great Practice of Medicine and the 3 editions of Osler and McCrae's System of Modern Medicine.

This extraordinary productivity was distributed over the entire span of his professional life from 1872 on, and it ran the full gamut likewise of his broad intellectual and philosophic activities. Thus, in his earlier years (Canadian and Philadelphia periods) his publications comprise a number of interesting studies on biology and physiology as well as a mass of material in the field of pathology; and in his later life he was still more prolific in literary and medico-educational and bio-bibliographic topics; these are in addition to his many publications in the field of clinical medicine, which remain his greatest contribution both in point of number and also probably in epoch-making value. These naturally bulk largest in his Baltimore period since he stood there at the head of the greatest medical clinic in America, just as his Canadian and Philadelphia periods are richest in communications on pathology.

His contributions on heart disease are drawn mostly from these two sources. In all there are some 250 items, distributed as follows: Congenital heart disease; diseases of the substance of the heart, articles on idiopathic hypertrophy, Stokes-Adams' disease, coronary disease, fatty degeneration, etc., malignant (or chronic infectious) endocarditis; valvular disease, chorea and rheumatic fever, etc.; arteriosclerosis and aneurism, angina pectoris, high blood pressure, relations of heart and kidney affections, etc., diseases of the pericardium and diseases of veins, articles on the diagnostic value of physical signs, on prognosis and on treatment. Among the most significant of the above are probably those on bicuspid aortic valve, on chronic infectious endocarditis, on the etiology of chorea and its relation to valvular lesions, on angina pectoris, high blood pressure and arteriovenous aneurism.

It was a happy thought that led your program committee to invite me to give a personal reminiscence of Osler in the course of an address on his work in relation to heart disease, for practically my entire personal contact with Dr. Osler during those early years of professional work that mean so much to us all, lay in and through my own curatorship of his great collection on cardiac pathology housed in the Medical Museum of McGill University that stands today as a lasting memorial to his fundamental work in this connection. And this contact meant much also in the development later of my own scientific work. This truly great experience I have the privilege to relate in some detail now. (Reminiscences followed).

HOSPITAL STAFF CONFERENCES

In the last number of the Annals we published a tabulation of the Smaller Medical Societies with their officer personnel and meeting dates. Below is the schedule for Hospital Staff Conferences. These meetings are open to the profession. A frank detailing of case histories with laboratory findings is offered. If a physician is a member of one or more smaller societies and on the staff of one or more hospitals, it may be appreciated that this physician's time is well spent.

HOSPITAL STAFF MEETINGS, OFFICER PERSONNEL, WASHINGTON, D. C.

HOSPITAL	CHAIRMAN	SECRETARY	REGULAR MEETING*
Children's	C. P. Howze	C. A. Schutz	2nd Tuesday
Columbia	E. W. Titus	R. O. Dart	4th Tuesday
Emergency	A. L. Riddick	E. J. Grass	4th Thursday
Episcopal Eye, Ear and Throat	W. H. Jenkins	J. R. Lloyd	1st Friday
Gallinger Municipal	W. A. Bloedorn	E. A. Bocock	2nd Thursday
Garfield Memorial	H. C. Macatee	J. W. Lindsay	1st Wednesday
George Washington University	W. A. Bloedorn	M. Glover	2nd Monday
Georgetown University	J. J. Mundell	W. P. Argy	1st Monday
Homeopathic	E. F. Sappington	Mrs. M. Miller	3rd Tuesday
Providence	J. T. Kelley, Jr.	C. Leibell	3rd Thursday
Sibley Memorial	L. H. Taylor	J. F. Elward	2nd Tuesday
St. Elizabeth's	Daily conferences at 11 o'clock, conducted by the First Assistant Physician.		

* Except summer months.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II SEPTEMBER, 1933 NUMBER 9

THE EARLY DIAGNOSIS OF CANCER OF THE RECTUM AND RECTOSIGMOID*

JOSEPH HORGAN, M.D.
Instructor in Surgery, Georgetown University School of Medicine

The early diagnosis of malignant lesions of the terminal portion of the large intestine is not made with the frequency which the knowledge and training of every physician would warrant. The results of clinical experience bear witness to this fact. Perhaps the two most important reasons for not making early diagnoses are:

1. The failure to make necessary examinations.
2. The failure to interpret properly the physical findings so that they may be better correlated with the symptoms.

THE EXAMINATION

Unfortunately in practice there is too great a tendency to neglect certain types of examinations. For example, pelvic examinations are not submitted to without some degree of hesitancy or embarrassment on the part of the patient and are frequently executed by the doctor with such restrained or perfunctory manner that the observations are most superficial. This is even more true of examinations of the anus and rectum. Since this is so, it is worth while to describe the best method of digital examination. I consider the best and the most adaptable position of the patient for examination to be the Sims' semiprone, lateral posture, or modifications of it. Its advantages are such that it can be used for the child or adult, male or female patient, the ambulatory or bedridden patient, conveniently in the office, home or dispensary service. In this position the patient is comfortable and relaxed and can coöperate with the examiner. It is convenient for the examiner. When for any reason it is desired, this position may be improved by placing a pillow under the side of the hips. When other positions are used, as for vaginal examinations, a rectal examination can be made at the same time.

The examination when properly made consists of:

1. Inspection of the anus and perianal tissues.
2. A digital examination of the anus and rectum.
3. An instrumental examination of the rectum.

Inspection of the anus and perianal tissue revealing alteration of the contours or ulceration of the surface gives evidence of pathology which may be related to malignancy of the anus or rectum.

The digital examination should reveal (1) any changes in the functional efficiency and structure of the sphincter and lumen of the anal ring and canal, (2) indurated or tender areas of the ischiorectal space, (3) changes in the walls of the rectum and adjacent space, and (4) the relation of these changes in extent and position with reference to the pelvic structures, which are in proximity to the rectum. With practice it is possible to obtain important information from the palpable abnormal changes of the mucosa and deep layers of the rectum and rectosigmoid. In making the rectal examination, it is well to remember that normally the rectum is 10 to 12 centimeters in length, corresponding in general to the length of the average adult index finger. Therefore, the finger reaches with comparative ease the full extent of the rectum, its tip coming directly in contact with the rectosigmoid. More definite and satisfactory examination of the rectosigmoid can be made if, while making the digital examination, pressure is exerted on the abdomen with the free hand to push the viscera deeper into the pelvis. By this simple procedure we may examine, even without special equipment, the part of the intestinal tract in which approximately 75 per cent of all cancers of the intestines take origin. This high incidence of cancer in a part so easily examined behooves us to make more careful examinations and to familiarize ourselves with the distinguishing features of malignant lesions there, since in this way only will early diagnoses be made. In a series of 300 cases diagnosed as carcinoma of the rectum and anus at the Mayo Clinic, 10 per cent had been subjected to hemorrhoidectomy elsewhere after the onset of symptoms.

---

* Read at the Annual Scientific Assembly of the Society, April 25, 1933.

The distorting effects and the gross structure of the various forms of adenocarcinoma of the rectum are rather characteristic. The raised, spongy, friable, or irregularly indurated bleeding edges about the ulcerated surface give impressions on palpation which serve immediately to arouse suspicion as to the nature of the lesion. Blood and pus and increased mucous discharge, although previously unnoticed by the patient, are invariably present in these anaplastic changes due to the erosion of the surface, and can be found by the examiner, except in the densely scirrhous type of cancer which ulcerates late. The latter is more easily recognized because of the firm structure which distorts the wall of the intestine and its canal as the size increases.

Examination with the aid of instruments gives further information. For purposes of this discussion, it will not be necessary to describe instruments used in special types of examination, but for the type of examination which should be made in every complete diagnostic study a smoothe, bivalve, non-fenestrated, spring, rectal speculum is of great value. This instrument may be electrically illuminated or the ampulla of the rectum may be illuminated through it by the use of direct or reflected light. Rectosigmoidoscopy should be performed by a competent examiner in all suspected cases and an X-ray study made by fluoroscopy and a barium enema in order that high sigmoidal lesions be not missed.

SYMPTOMATOLOGY

Age and Sex. Carcinoma of the rectum is more common in men than in women, the ratio being about 65 per cent in men and 33 per cent in women, a 2 to 1 ratio. The reported age range is 13 years to 70 years, the usual range being from 40 years to 70 years and the average age being 56 years.

Rate of Growth. The rate of growth of the lesion is extremely variable. It has been stated that it takes 6 months for the lesion to advance along one-fourth of the circumference, but this is not dependable, is often misleading and gives no index to the degree of infiltration or metastasis. Fortunately glandular metastases develop slowly as compared with other forms of malignancy of the intestinal tract, with the exception of carcinoma of the transverse colon, where glandular metastasis is exceedingly slow. However, a classification of the grade of malignancy based upon a study of a biopsy specimen, as described by Broders, is always desirable.

The duration of symptoms is variable. The absence, or the vague nature of symptoms, in the early stage of carcinoma of the rectum, make them of no value in establishing the diagnosis. There are no usual complaints, nor is there any uniform characteristic to those which are given, so that the subjective factors are negligible and not dependable. This constitutes a definite reason for the delay in diagnosis, and even when some symptoms may have been present, the Mayo Clinic group has estimated that they have existed for the average duration of 11.7 months before coming to operation. A similar conclusion may be taken from the report on carcinoma of the rectum by the British Ministry of Health in an analysis of 1,234 cases in which the average duration was found to be 13.1 months.

Constipation and Bowel Irritability. Constipation may be one of the earliest symptoms. Marked constipation and obstipation, in fact, any irregularity of bowel movement. should be investigated. The patient's idea of constipation should be analyzed. One should determine the number and kind of stools and whether the bowel movements have had to be provoked by use of medications. Miles of London stresses the importance of analyzing the bowel irregularities in making a diagnosis in this group of cases and reminds us that abdominal distention may be absent even when the bowels do not respond to cathartics.

Bowel irregularity is a frequent early sign. Malignant lesions, as well as others, of the terminal portion of the colon and rectum give clinical evidence of hypermotility, which is excited by the irritation of the tissue and is accompanied by excessive secretions, especially in the presence of ulceration, giving rise to diarrhea, "morning stool," excessive gas and a sense of incomplete evacuation. When present without bleeding or other definite findings, these symptoms can be easily explained on some other basis, but in the adult they should always put one on his guard until cancer is ruled out. "Morning stool," the small, semi-solid stool which comes early in the morning and precedes the usual stool, should always arouse suspicion.

Bleeding. Bleeding is rarely an early sign. It is somewhat directly proportionate to the size and degree of ulceration of the bowel. Buie has noted that even when the diagnosis was established only 84 per cent gave a complaint of bleeding. He also observed that in the lesion of the rectum and sigmoid the average blood hemoglobin was 72 per cent, which shows that anemia does not become established except in the late stages of the disease and that, therefore, the lesion is well advanced when bleeding becomes a complaint. These observations were based on a study of 1,937 cases.

Pain and its Relation to Site of the Lesion. Except in lesions of the anus, pain is not a characteristic sign. Sacral backache and a sense of discomfort or weight in the region of the rectum may be present but these complaints are rarely present in the early stage before infiltration develops.

Asthenia and Malnutrition. These are late manifestations. They are not found in the early stages as a direct result of the presence of lesion. Rankin and Jones, in a study of a group of 298 cases in which the diagnosis of cancer of the rectum had been made, reported that 74 per cent of the patients were well nourished at the onset of symptoms.

COMMENT

Early diagnosis, therefore, must be based chiefly upon the physical findings. This places another burden upon the physician. When any complaint, particularly irregularity of evacuation, bleeding, or any form of pain, attracts his attention to the region of the rectum, adequate examination should be made to rule out the possibility of malignancy, and on all patients over 40 years of age, particularly men, a rectal examination should be included in the routine physical study. When this is done with greater frequency, the physician will soon become familiar with the normal findings and learn to appreciate the variations from the normal. The malignant lesion will be more easily recognized and many patients saved from the agony and distress occasioned by the terminal pain and suffering and the terrific economic problems which the neglect on the part of the physician would cause.

CONCLUSIONS

1. Early cancers of rectum and rectosigmoid do not give signs and symptoms.
2. The lesion may be large before bowel irregularity, bleeding or pain develop, usually the earliest symptoms.
3. Early diagnosis cannot be made with greater frequency unless the routine examination of patients, particularly those over 40 years of age, includes a digital and instrumental examination of the rectum.

BIBLIOGRAPHY

Broders, A. C.: The Grading of Carcinoma. Minnesota Med., 1925, **8**, 726.

Buie, L. A.: Carcinoma of the Rectum, Rectosigmoid, and Sigmoid. Surg. Clin. N. Am., 1924, **4**, 361.

Miles, W. E.: (Quoted by Rankin, F. W., Bargen, J. A., and Buie, L. A.) The Colon, Rectum, and Anus. Philadelphia, W. B. Saunders Co., 1932.

Rankin, F. W., Bargen, J. A., and Buie, L. A.: The Colon, Rectum and Anus. Philadelphia, W. B. Saunders Co., 1932.

Rankin, F. W., and Jones, R. D.: Carcinoma of the Rectum. West Virginia M. J., 1929, **25**, 5.

Report on Cancer of the Rectum, London, Ministry of Health, His Majesty's Stationary Office, 1927, **46**, 70.

RECURRENT MALIGNANT OBSTRUCTION OF PROSTATE, UNRELIEVED BY PROSTATECTOMY, TREATED BY TRANSURETHRAL RESECTION*

Report of Five Cases

W. Calhoun Stirling, M.D.

Associate Professor of Genito-urinary Surgery, Georgetown University School of Medicine

and

G. A. Hopkins, M.D.

Washington, D. C.

Although it is generally agreed by most writers that surgical treatment of cancer of the prostate gland has been entirely unsatisfactory other than as a palliative measure, transurethral resection offers a valuable and conservative method for the relief of obstruction due to cancer. Also, the diathermy current seems to have a deterrent action on the growth of the cancer cell. Of 12 cases of cancer of the prostate gland seen by us in the past year there were 5 which were of considerable interest either from the standpoint of the morbid anatomy or treatment. We shall briefly report these cases.

Report of Cases

Case 1: Mr. J. M., aged 55 years, was seen for the first time in July, 1932. He gave a history of nocturia with difficulty in starting and stopping the urinary stream, these symptoms having been present only for a few months and having gradually increased in severity. Rectal examination revealed a hard, irregular, nodular mass involving the prostate and seminal vesicles. There was an annular ring extending around the rectum arising from this growth, almost completely occluding the rectum. A flat roentgenogram showed osteoplastic metastasis to the sacrum and ilia. Cystoscopic examination showed an indurated bladder neck with moderate protrusion of the median lobe of the prostate. There was 90 cc. of residual urine. The patient has lost 15 pounds in weight and has gradually become weaker. Because recently there has been a marked diminution in the caliber of the urinary stream with increasing nocturia, a resection is to be done next week and deep x-ray used for the metastatic pain as it develops. Also an emergency cecostomy is contemplated as soon as the rectum becomes completely occluded by the new growth.

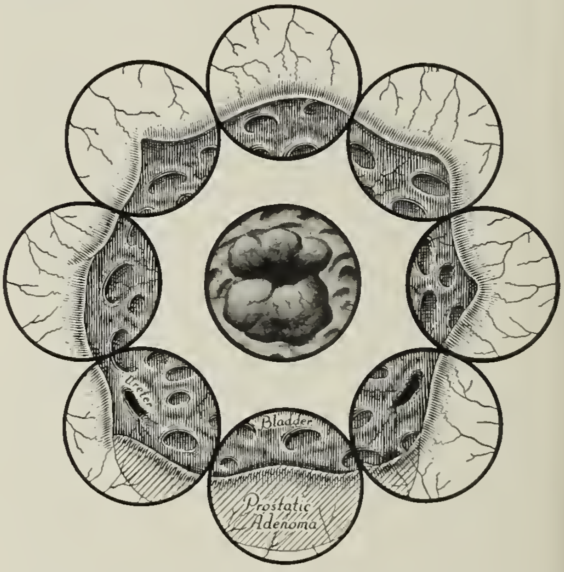


Fig. 1. Composite Picture Obtained with the Right Angle Cystoscope with the Center Drawing Representing the View Obtained with the New Retrograde Lens.

The latter is of value in estimating just where the field of resection is located.

Comment

This case represents a rare type of prostatic malignancy in which the growth extends posteriorly involving the rectum. Metastasis has occurred, making the prognosis hopeless. Frontz says that only 1 such similar case has been seen in the Grady Urological Institute. Open prostatectomy in this case would only hasten diffusion of the malignancy. Resection is especially indicated in this type of case.

Case 2: Mr. W. D. G., aged 68 years, suffering from retention of urine, was first seen April 25, 1932. A suprapubic prostatectomy in July, 1931, performed elsewhere, had revealed a carcinoma in the removed gland. Following the operation he had been unable to void and at intervals of 2 months he had had tissue punched out of the bladder neck. The patient had not been able to void since his operation. Cystoscopy performed by us was difficult and showed marked fixation and induration of the tissues of the prostatic urethra. The patient was prepared and later resected under sacral anesthesia, and 6 grams of carcinomatous tissue were removed between the verumontanum and the trigone. The urethra immediately became relaxed and the instrument could be manipulated freely. He was discharged on the 3rd day, voiding normally, and has been seen at intervals since that time. He has gained 12 pounds, eats and sleeps well and has resumed his farm duties.

---

*Scheduled to have been read before the Society, March 29, 1933.

COMMENT

This case represents a type of case in which malignancy is found on section after operation and the patient never understands why he does not enjoy the functional return of urination as he was promised. This case was ideal for resection, since the lumen of the urethra can be kept open from time to time by resection with little or no disturbance to the patient (Figure 1). The X-ray film of the pelvis showed no evidence of metastasis, but a series of deep X-ray treatments was given.

Case 3: Mr. E. M., aged 62 years, entered hospital June 15, 1927, with acute retention of urine. The x-ray film having shown no evidence of stone or metastatis, he was given the usual preoperative preparation and on June 27, 1927, a prostatectomy was done. The patient left the hospital on July 20, 1927, able to void normally and completely. Serial sections made from the removed gland showed no evidence of malignancy. We were again consulted by the patient on July 6, 1932, at which time he entered the hospital again for acute retention of urine. Rectal examination at this time showed the prostate to be very hard, irregular and nodular and quite fixed in the region of the seminal vesicles. After the anemia had been treated a cystoscopic examination was made and showed a moderately enlarged, irregular median lobe with a tortuous prostatic urethra. On July 14, 1932, under transsacral anesthesia this lobe was resected. Bleeding was extremely free since the tube surgical unit was used, and could be controlled only after repeated coagulation. Sections made from the gland at this time showed adenocarcinoma. Following this procedure the patient was able to void fairly well but continued to have 90 to 100 cc. of residual urine with nocturia. He was readmitted to the hospital and after decompression was again resected on October 31, 1932. There had been some new growth since the last resection, showing that the tumor was a rapidly growing one. Six grams of carcinomatous tissue was removed at this time with very little bleeding, since the spark-gap unit was used. The patient left the hospital 3 days later voiding with a much better stream. He was in the office last week, was able to void normally and had no residual urine. He has gained in weight and says he feels very well.

COMMENT

This case represents a rather fast-growing malignant degeneration of the prostate in the presence of benign hypertrophy and is very similar to the first case reported in that the prostatic capsule had been invaded by the malignant cells before prostatectomy was performed. However, there was an interval of 5 years in which the patient was free from symptoms. This case shows the importance of making a minute histologic study of the removed gland. Resection will probably have to be repeated since this tumor is quite malignant (Grade III or IV) and soon refills the urethra. Deep X-ray was also used on calcium given to control the pain.

Case 4: Mr. W. B. S., aged 72 years, entered hospital, December 31, 1932, with urinary retention and dysuria. There was 200 cc. of residual urine. On rectal examination the prostate was found to be soft, smooth and symmetrical and showed no evidence of malignancy. The seminal vesicles felt soft, and a roentgenogram taken at this time showed no evidence of metastasis in the bones. On January 26, 1933, after the excretion and retention tests became normal, 16 grams of prostatic tissue was resected. The patient was able to void while still on the operating table and left the hospital 7 days later with the first-stage suprapubic sinus almost closed and an indwelling catheter in the urethra to facilitate its closure. He was seen at home daily until healing had entirely taken place and he was voiding well. Sections removed from the prostate showed a leiomyosarcoma of low-grade malignancy.

COMMENT

This case represents a rare type of malignancy. Since the pathologist's report graded it as a type I according to Broder's classification (low-grade), the patient will probably enjoy a long interval without the return of his former symptoms.

Case 5: Mr. C. W. M., aged 62 years, entered hospital, February 20, 1932. He gave a history of urinary retention and inability to empty the bladder. There was 200 cc. of residual urine. On rectal examination it was found that the enlargement was confined to the left lobe, which was large and symmetrical although soft and showing no suggestion of malignancy. The patient had had a carcinomatous lesion involving the left nipple which had been removed by deep x-ray and radium seeds 7 months previously. Decompression was instituted, and after the blood and excretion tests became normal resection was carried out under sacral and gas anesthesia, a deep gutter being made through the prostate from the trigone to the verumontanum. He was discharged from the hospital 3 days later with no residual urine and voiding a good stream. However, in spite of the fact that there was no residual urine and he was voiding well, pain in the rectum followed with the passage of mucus in the urine. This was not relieved by vesical irrigations. The urine was very alkaline and an alkaline cystitis developed. Culture of the urine showed staphylococci and Bacillus coli infection. The bladder was irrigated with phosphoric acid to render it acid. Cystoscopic examination showed a small amount of tissue at the site of the first resection, although there was no residual urine present and the caliber of the stream was normal. On September 21, under low spinal anesthesia a second resection was done, leaving a wide open gutter from the trigone to the verumontanum. He left the hospital on the 4th day. Sections from the resected area showed no malignancy even at this time. He continued to complain of pain in the rectum, however, extending over several months' time, and after several consultations it was decided to put the bladder at rest by suprapubic drainage. This was done on January 25, 1933. When the bladder was opened a careful examination was made of the prostatic urethra, which was found to be wide open so that 2 fingers could be admitted all the way to the cut-off muscle. There was no intravesical protrusion of the prostate, so that the 2 resections had entirely relieved the obstruction, as well as permitted complete evacuation of the bladder content. The tissues about the internal sphincter were extremely hard, indurated and unyielding. Malignancy was suspected at this time and was confirmed at the 2nd operation when an attempt was made to remove a moderate sized nodule attached to the rectum. This tissue was very dense and brittle and could be removed only in pieces. Microscopic sections showed grade III adenocarcinoma. Before operation he received deep x-ray treatments and radium was to be used in the prostatic urethra. The patient died on March 19, 1933, of carcinomatosis.

COMMENT

This case presented a reversal of the usual train of events, since this is the first case in our experience in which the prostatectomy was attempted following resection. He probably would have lived much longer if a suprapubic operation had not been done, opening as it did the prostatic lymphatics, carcinomatosis resulting. Radium in this case in the form of screened needles or gold seed after the method of Ferguson would have better answered the purpose. Calcium had apparently entirely relieved the persistent rectal pain.

DISCUSSION

These cases emphasize the importance of early recognition and treatment of patients with prostatic obstruction. Since the general practitioner is the first to see these prostatic cases, his routine study should always include a rectal examination. Hunt found 58 per cent of men past 50 years of age had symptoms referable to the prostate gland. Young found "carcinoma in 20 per cent of patients applying for prostatic enlargement." There is a characteristic stony induration of the carcinomatous prostate gland with fixation of the surrounding tissues. Because a majority of these cases have metastasized beyond the prostatic capsule when first seen (Barringer at Cancer Memorial Hospital says "that in but 2 to 5 per cent of all cases is the carcinoma confined to the prostate"), a preliminary roentgenologic study of the pelvis and lumbar spine should always be made before treatment is begun. Once metastasis supervenes the treatment becomes palliative only and should be directed toward the relief of pain and keeping the vesical outlet free.

Having submitted a questionnaire to 15 outstanding urological surgeons as to the treatment of cancer of the prostate, we found a marked divergence of opinion as to the best way to handle such cases. Seven of the urologists feel that resection answers the problem as far as the obstruction is concerned; 5 are of the opinion that radium has no curative properties, while 8 use it in some form. Six of these writers believe that deep X-ray therapy has no curative effect; 2 think that it causes definite shrinkage in the gland, and the remaining 7 use it to control pain and bleeding. In the presence of obstruction, Young's radical prostatectomy is advocated by 2 writers, while 5 prefer palliative cystotomy for drainage. It is our practice in the presence of obstruction to give the patient a preliminary course of deep X-ray therapy, followed by transurethral resection to relieve the prostatically encumbered urethra. In the early cases when the growth is confined to the prostatic capsule radium needles or gold seed implanted throughout the gland by means of a suprapubic cystotomy and followed by resection should cause less diffusion of malignant cells than radical surgical treatment. Russell Ferguson uses 25 to 75 mc. of radium in 2 mc.

gold seed in these cases and reports 16 cases, 14 of which are living and well over 24 months' time with good primary results.

Conclusions

1. Cancer of the prostate presents one of the most difficult therapeutic problems in urology.

2. In the presence of urinary retention resection is of great value in keeping the urethra patent and seems to slow up the growth of the cancer cell.

3. Radium either in the form of seed or needle has produced many cures if used before metastasis has occurred.

BIBLIOGRAPHY

Barringer, B. S.: Phases of the Pathology, Diagnosis and Treatment of Carcinoma of the Prostate. J. Urol., 1928, **20**, 407.

Ferguson, R.: Personal Communication, 1933.

Frontz, W. A.: Personal Communication, 1932.

Hunt, V. C.: Immediate and End Results of Suprapubic Prostatectomy. Collected Papers of Mayo Clinic and Mayo Foundation, Philadelphia, W. B. Saunders Co., 1927, **19**, 496.

Young, H. H.: Practice of Urology. Philadelphia, W. B. Saunders Co., 1926.

RESULTS OF THE TREATMENT OF GONORRHEAL OPHTHALMIA*

Edward J. Cummings, M.D.

Clinical Instructor in Ophthalmology, Georgetown University School of Medicine

In presenting this subject to you today, I am reporting upon a group of cases that comprises a wide range of ages in order to show what can be done with a disease that has inspired fear in all physicians who come in contact with it. My contact with these cases has been largely bound up with my service at the Gallinger Municipal Hospital, and hence I have drawn upon the records of that institution for a large number of the cases herein discussed. The cases have been studied over a period of about two and one half years, and they are about equally divided between the Georgetown service and the George Washington services. In the Georgetown group there were 10 recorded cases, but to these I shall add 2 more cases, whose condition and outcome I personally remember, but whose records I was unable to locate. In the George Washington group there were 12 cases of record.

Starting with the Georgetown group, we find that the ages range from 8 days to 41 years; 4 were white and 6 colored. Both eyes were involved in 4 cases, 2 children and 2 adults, and the right or left eye in the other 6. In 2 of the cases there was definite corneal disturbance in a child 5 years old and another 15 years old. The child of 15 showed some clouding of the cornea, and the child of 5 showed a little erosion of the corneal epithelium with considerable degree of clouding. This child had never had any trouble with its eyes until the mother removed a hair from the involved eye 4 days prior to admission. In the adults, a genital gonorrhea existed coincident with the eye condition. In all of these cases smears from the eye were positive for gonococci. The entire 10 recovered without any ocular damage whatever.

This looks like a 100 per cent record for cure, but my memory serves me too well. The 2 cases I wish to add to this group are a colored child of 5 years and a white woman of 81 years both with infection of both eyes. Both cases showed certain points of interest. The child had an intense infection of the right eye of 6 days' duration prior to admission. The cornea was damaged and there was intense chemosis. The cornea ruptured in this eye, and the vision was lost. The left eye became involved shortly after admission, but this eye was saved. The woman had severe infection of the right eye and moderate degree of the left. Smears from the genitals were positive for gonococci. The intern told me that the patient had been bathing her eyes with her own urine. Smears from the eye were positive. A rigorous outline of treatment was ordered, but through some misunderstanding it was not carried out: A few days later when I saw the patient the right eye was gone. Not long afterward she died as a result of other conditions.

---

* Read at the Annual Scientific Assembly of the Society, April 26, 1933.

In the George Washington group the age range was from 1 week to 40 years, and there were 5 adults, 4 children and 3 new born babies. All of the patients were colored. In 4 cases both eyes were involved. In all of the adults genital gonorrhea was present. Smears from the eyes in all cases were positive for gonorrhea. One case was interesting in the fact that the infection was present in an eye socket in which there was an artificial eye. He evidently introduced the infection from himself to the socket by handling the artificial eye. Loss of vision here could not be charged against the infection. Out of the other 11 cases there was 1 eye in a man 40 years old in which vision was lost. This is the only case in the group that showed corneal involvement, and the infection existed 2 weeks prior to admission. Leaving out the socket infection in this group, we have a return to normal in 10 out of 11 cases.

In my own private experience 4 cases came under my observation and care: a baby of 12 days with both eyes involved, a young man aged 24 years with the right eye affected, a man of 32 years with involvement of both eyes, and a woman aged 54 years with infection of the right eye. Smears from the eyes in all cases were positive. The mother of the baby was infected, the men had genital infections, and a satisfactory history could not be elicited from the woman unless she infected her eye with a soiled towel or touched her hands to a toilet seat in a public toilet. The baby got well after 2 weeks of treatment and was permitted to go into a home with other children. Both men got well. The man with the infection in both eyes was well within 6 days after treatment was begun. This was the quickest recovery, and the rapidity of recovery was due to the fact that the patient was put under treatment within 48 hours after the onset of symptoms. The woman 54 years of age was the case of longest duration. She came under my care on the 9th day after the onset of symptoms. The right eye was violently inflamed with an erosion of the cornea in the upper half of the limbus. Left eye was not infected. A large corneal ulcer developed which went through a period of exacerbation and recession that culminated in a perforation of the cornea in the 6th week while the patient was walking across the kitchen floor. The eye healed following the rupture with an incarceration of the iris at the point of rupture and a leukoma that practically obliterated vision except for light and shadows and some few objects in the temporal field.

There was here a group of cases in which there was infection in a total of 38 eyes. Out of this number there was loss of vision in only 3 eyes, total loss of an eye in 1, and complete restoration of sight in 34 eyes, representing cures in approximately 90 per cent of the eyes. I take no credit or responsibility for the cases treated on the George Washington service at the Gallinger Hospital, but I cite these cases to show results in a treatment that is essentially the same for both services in the hospital.

Dr. LeRoy W. Hyde, of this city, in a paper a few weeks ago, presented an interesting study of a group of 48 cases treated at the Children's Hospital wherein there were 21 cases of ophthalmia neonatorum, and 27 cases ranging in age from 13 months to 21 years. The ophthalmia neonatorum group presented the following interesting facts. Eighteen patients recovered the sight of both eyes, 14 of these cases having had infection in both eyes. In the 3 cases in which sight was not recovered, one had an opaque cornea on admission with a discharge from the eye that had existed for 6 weeks, the second showed 2 active ulcers of the right cornea and a healed ulcer of the left with a discharge for 3 weeks prior to admission, and the third developed an ulcer of the left cornea 3 days after admission with a discharge from the eye 5 weeks before admission. This is a very creditable record and shows the chances for cure if the patient is treated early and the chances for disaster if treated late.

The treatment in these cases was practically identical with that used at the Gallinger Hospital, except that in some of the Children's Hospital cases foreign protein was injected. The treatment consisted primarily in very frequent, unremitting irrigation of the infected eyes, with 2 or 3 per cent solution of boric acid and careful protection and watchfulness over the unaffected eye. Special nurses are required in the severer cases and if necessary the help of another nurse to assist in opening the lids during the irrigation. It is my practice to use 20 per cent argyrol after the irrigation with sterile petrolatum, if needed, to prevent maceration or gumming of the lid margins. Compresses, cold or hot, may be used to allay symptoms of pain, but their merit is of doubtful value. I never use mercurochrome, chiefly because it is too painful. Atropine is used only in those cases that show involvement of the cornea or iris.

In conclusion, there are a few points I wish to bring out. In babies the time of the onset of infection may place the case in the class of true gonorrheal ophthalmia neonatorum or in a class of cases considered not to have developed during parturition. If no infection appears within the first 7 days, then it is reasonable to believe that the appearance of any subsequent infection did not occur during parturition. The highly resistant cornea of the baby stands this disease extremely well, and the results of treatment are highly favorable.

The intensity of the disease is in direct proportion to the intensity of the infection, and the intensity of the local signs in the involved eye is a good measure of the intensity of the infection. Treatment is guided in proportion to the degree of infection.

It is a fallacy to state that gonorrheal ophthalmia in adults is fatal to the eye. A case received within the first 5 or 6 days from the onset of infection has a good chance of recovery. The chances for recovery diminish in cases treated after this time. In my observation there are no so-called chronic cases; when the infection is over, the eye is cured.

I view this disease with respect, but not with consternation. This form of conjunctivitis is just as curable as other forms provided the treatment is established early. A determined watchfulness for early recognition of these cases combined with an early and thoroughly administered treatment will bring us closer to a 100 per cent of cures.

"APPARENTLY IN GOOD HEALTH PRIOR TO THE ACCIDENT"

(*A medico-legal analysis of the evidentiary fact of record of apparent good health of the injured employee prior to his alleged industrial accident in workmen's compensation litigation*)

Kurt Garve, M.D.

Los Angeles, Calif.

Southern Casualty Company v. Flores (1) was a case in which one Flores, deceased, had been in the employment of one Lehr, a cement contractor. The nature of the job to which deceased had been assigned is only disclosed by inference from the prior completion of a ribbon driveway between the front of the garage and a sidewalk. Lehr's employees, including Flores, were supposed to begin actual work at 8 o'clock in the morning. The tools were kept apparently in the garage. From the front of the garage to the surface of the street, the surface of the driveway gradually rose an aggregate of 9 feet and some inches. Flores had arrived at the place of his work, the garage, and thereafter, and about 5 minutes before 8 o'clock of the morning of the day of his injury he left the garage, walked up the driveway, passed some other employees, went about 8 feet, fell, and died immediately, or within a short time. An autopsy showed that the tissues had undergone no immediate change save that one side of the heart contained too much blood, while the other one contained none at all. Blood was taken from the heart, and upon test, it was shown that the blood indicated "four plus Wassermann," the maximum evidence of syphilis. There was agreement among the medical experts during the trial before the Industrial Accident Commission—suit having been brought by the dependents of the deceased under the Workmen's Compensation Act—that Flores had been in a dangerous condition because of his heart trouble, in which death might have come on with any physical exertion.

Some of the medical men testified that they attributed death to the disease alone, while others were of the opinion that the exertion of the walk might have been the cause thereof, proximately or contributorily. The history of the case, the evidence showed, was that Flores had been a man of 35 years of age, had weighed about 170 pounds, and apparently had been strong and healthy. He had been working for some months for his employer, Lehr, and, so far as shown, had done so without loss of time from illness or inability of any kind. Judgment was given in favor of the beneficiaries for compensation for death of the injured employee, which was affirmed by the Court of Civil Appeals. Writ of error from this appeal was filed upon assignments that the record was devoid of evidence showing or tending to show that death resulted from accident. The judgment of the Court of Civil Appeals and of the Commission was reversed, and judgment entered for the employer, the court holding that there was no sufficient evidence to prove that the injury had arisen out of the employment, that death had been due to failure of the heart while Flores had been walking up the sharp incline, and that this was a case which belongs to that class in which the supposed injury came from a hazard to which the workman would have been equally exposed apart from his employment, and that death, therefore, was not compensable under the Workmen's Compensation Act.

What was it that the court did before it reached the conclusion as to the ultimate facts of the case? It weighed the probability of an industrial accident represented among other things by the evidentiary fact of apparent good health prior to the accident and the probability of the culmination of a pre-existing disease, independent of the employment, as evidenced by the findings of the postmortem examination and the laboratory test. And, in so doing, the court impliedly admitted that there may be persons suffering from a grave disease and yet appear healthy at the same time. It is this term of "apparently in good health prior to the accident" to which this paper shall be devoted.

THE MEANING OF THE TERM, "APPARENTLY IN GOOD HEALTH PRIOR TO THE ACCIDENT"

While in the ordinary sense the term "apparently in good health prior to the accident" means exactly what common language, understanding, and usage will attribute to this phrase, as seen from the standpoint of the judiciary, however, this expression is apt to take on a somewhat different coloring. As workmen's compensation acts are to be construed liberally in favor of the employee (2), courts will be inclined to interpret this evidentiary fact as indicating a factor tending to prove that there had not taken place the culmination of the pre-existing disease, independently of the employment, as claimed by the defendant employer. On the other hand, for the medical man this term is rather equivocal. It may mean that the doctor had come to the conclusion, after a fairly skilled examination, that he could not find any pathology, remembering, however, the shortcomings of the present day's diagnostic means. For the purposes of this article we shall define the phrase of "apparently in good health prior to the accident," as used in workmen's compensation litigation, as indicating either the absence of any pathology whatsoever, or detectable pathology, or as denoting a phase, or phases, of a bodily or mental morbid state of health, not strong enough to produce in the deceased's physical or mental condition any change, visible to lay persons of average gift of observation, and not intense enough to pass the threshold of the patient's conscious mind making him aware of the fact that he is seriously sick, disabled, or predisposed to constitutional shortcomings of a comparatively grave character when compared with persons of fair average health.

From this definition it becomes clear that the expression "apparently in good health prior to the accident" is a general and compound concept, consisting of different and fundamentally unlike elements. It is the summation of inferences from other evidentiary facts or presumptions which lead to the conclusion that the employee must have been apparently in good health prior to the accident.

COMMON EXPERIENCE OF LIFE

Thus, as a large majority of working people, particularly when doing hard manual labor, appear fairly healthy, in the absence of any showing to the contrary, commissioners will draw this inference in favor of the injured workman, whenever the facts suggest to so do. Where the claimant is, or has been, a strong, hearty, healthy, or husky looking man (3). or where he had never required the services of a physician or surgeon prior to his alleged industrial accident (4), the inference is reasonable that his health has been seemingly good. The direct evidence (5) of the injured employee himself that he had been well all the time up to his alleged industrial accident, or that he had been unaware of any infirmity, will always have a favorable influence upon commissions and courts. Likewise, where the claimant testifies (6), as a matter of fact known to him, that he had not suffered, according to his knowledge, from a certain disease, which is claimed by the employer to have culminated independently of the employment, though during the course thereof, such denial of the employee will often have a strong bearing upon the final outcome of the case.

EVIDENCE OF FRIENDS, RELATIVES, MEMBERS OF THE FAMILY, ETC., OF THE INJURED EMPLOYEE

Stronger than the testimony of the injured employee himself is that of other credible witnesses who had had an opportunity to frequently observe the claimant prior to his alleged industrial accident, and particularly when such witnesses are disinterested third parties. When members (7) of the family, friends, relatives, or acquaintances (8) of the injured workman who had had with the claimant frequent contact of comparatively recent date and prior to his alleged industrial calamity, had not noticed any sickness of the employee prior to his calamity, there is good evidence in favor of the injured that an industrial accident may have happened in fact. The reason is that diseased persons are not likely to hide their illness before members of the family, or before friends, for more than a short time. Sooner or later some of these persons with whom the claimant has come in such a contact will notice some change, mental or physical. The employee will not follow his usual hobbies with the same spirit of activity and enjoyment as he had done before he had taken sick. He would presumably act like any other sick person under the same or similar circumstances. He may lack the usual vivacious vitality. Most likely he would complain to his wife, if married, or to his friends, or parents. Thus, in Raina v. Standard Gaslight Co., of New York (9) a former employer for whom the injured employee had worked several years prior to the calamity under investigation was permitted to testify to the injured employee's eyesight at that time, although several years had elapsed since the termination of that employment and prior to the alleged industrial accident during which the witness had not seen the claimant. That Christian Science and other mental cults (10) may be factors to be reckoned with in the suppression of manifestations of ill-health by the employee, at least to a certain degree, should also be borne in mind.

EMPLOYMENT AND APPARENT GOOD HEALTH PRIOR TO THE ACCIDENT

Circumstances in relation of the employee to his employment should be considered as an aid in evaluating the evidentiary fact of apparent good health prior to the accident. When a workman does not lose any time on his job on account of sickness prior to his alleged industrial accident (11), there is evidence that the employee had been apparently healthy up to the time of his calamity. Medical treatment is apt to interfere with the employee's work in some manner. There may be loss of time, lessened efficiency of the workman; there may be circumstances which call the attention of his superiors, or of his employer, to the fact that the employee is sick, or under medical treatment, at or about the time of the alleged industrial accident. The same reasoning applies to the evidentiary fact that the employee had worked steadily for the same employer, although it is very much weaker than that of lack of leave of absence on account of sickness. The longer an employee has worked for the same employer, the more plausible it is to assume that the claimant had not been in the position of deceiving his master as to his physical or mental health. The length of time of service is, therefore, not infrequently mentioned in the decisions of the commissions and courts of appeal to make or to sustain an award in favor of the injured employee.

When the employee had died in consequence of his injury, when there had been no eyewitnesses to the act of injury, and when the case rests upon circumstantial evidence alone, liability of the employer may easily be made out by the fact that fellow-servants, superiors, or the employer, had not noticed any sickness of the deceased prior to his fatal calamity (12). And, when the employee, prior to his alleged industrial accident, had received over a longer period of time of his employment up to the time of his calamity the same salary, it may be assumed that the work performed by the employee had been satisfactory. This, in turn, will strengthen the assumption that the workman had been fairly efficient, and, therefore, healthy. Employers do not usually keep inefficient workers for any longer time in their services for the same wages, unless there are some special reasons such as personal friendship, the fact that the employee is a stockholder of the employer company for which he is working, marriage, or other family relations, or other motives explaining why the employee, inefficient because of being sick, has been retained on the payroll. When the employee had been working for the same employer for the past 5 years prior to his calamity and had "commanded top wages (13)," or, when he had received a raise in salary (14) before the accident happened there is evidence tending to prove that the workman had been efficient, or that his efficiency had increased prior to his calamity. And these facts, in turn, again point to apparent good health prior to the accident, in the absence of any other showing to the contrary.

Previous Medical Examination of the Employee by Third Party

Good use may be made by the injured employee in establishing his previous apparent good health and thereby of the probability of an industrial accident of the fact that he had taken out life or health insurance a comparatively short time prior to his calamity. When the claimant for compensation had been pronounced healthy by the medical examiner of an insurance company prior to his calamity, the probability is strong that the employee had been fairly healthy at the time of such a medical examination. The reason is obvious. Health and life insurance companies have an interest in detecting physical ailments of the applicant for insurance because of the risks involved. It is the practice among insurance companies to carefully value the state of health of prospective policy holders including their habits and occupations. The amount involved in the policy is controlling. The higher the premium, the higher the risk, the more carefully conducted the medical examination of the applicant. Therefore, ordinarily the record of an insurance company carries with it a high degree of unbiased and truthful testimony as to the apparent good health of the injured employee prior to his accidental injury, particularly because these insurance companies are disinterested third parties as to workmen's compensation litigation between employer and employee. Thus, it was held in Balzer v. Saginaw Beef Company (15) that the claimant for workmen's compensation was entitled to compensation because of an industrial accident he had suffered. The court based its decision apparently much upon the strength of the commission's findings that the employee, some 6 months prior to his alleged accident, had, upon application for life insurance, been examined by a medical examiner of an insurance company, had been found healthy by the medical man, that his urine tested at that time did not show any signs of diabetes mellitus, and that the employee, in fact, had obtained his policy. All the evidence tended to prove that, before the accident, the employee had been a well man. A few days after the alleged industrial accident his urine was examined, and there was found indication of presence of diabetes mellitus. The court, in affirming the commission's award, held that the conclusion that the diabetic condition resulted from the industrial accident was not based upon mere conjecture, surmise, or speculation, because there was medical expert testimony, though contradicted, that diabetes mellitus may develop after an accident. When, however, a policy is issued without physical examination, the evidentiary value of the fact that the claimant had obtained life insurance is comparatively trifling save, possibly, for the admissions against the claimant's interests written down or made by the employee in the application blank.

The investigation into the injured employee's state of health prior to his alleged industrial accident should also reach into the angle of possibility of the employee having made application for a governmental position under the Civil Service Law. And, where the employee, prior to his calamity, had been rejected by the Civil Service Commission, there may be an indication that the employee's health had not been up to the requirements of the commission.

When the employee had entered successively upon several employments with different employers, and when he had been examined by the "company doctor" of one or more of such preceding employers and had been found healthy or fit for the work applied for prior to the accident under litigation, such evidentiary fact may become exceedingly favorable for the employee in his later suit for workmen's compensation against an employer in whose services the injury was received by the servant. The analysis of the following case is very instructive in this respect. In Royal Indemnity Company et al. v. Industrial Commission et al. (16), the commission had awarded workmen's compensation to one Bennett, which award had been affirmed by the District Court. A reversal was sought by the employer's insurance carrier. It was conceded that Bennett had met with some accidental injury arising out of the employment. To defeat the amount of compensation awarded, it was claimed that a part of the injury, or disability, had not been the result of the industrial accident, but rather the culmination of a pre-existing disease, independent of the employment. At the trial before the commission all the medical experts agreed that after the accident the vision of the claimant's left eye was seriously defective. As to the cause of loss of vision of the eye, however, the medical men were rather indefinite. Several doctors expressed the opinion that the condition of the eye was congenital. An eye specialist who had seen Bennett a short time after his calamity and who had treated him testified that he diagnosed the eye trouble as amblyopia exanopsia, or. in other words that the left eye had become practically blind on account of non-use during an early part of the claimant's life. No medical expert was prepared to attribute the loss of vision to the injury which the employee had received during the course of his employment. Most doctors had seen the employee a long time after the accident, and it was their explanation that on account of the time intervening they were unable to be more certain and definite. There was received in evidence and considered by the commission a report made to the Denver and Rio Grande Railroad Company, 15 years prior to the litigation, by the railroad company's surgeon whose duty it was to examine applicants for employment with the railroad company and to make out a written report. This report was made on a printed form prepared by the railroad company for the use of such occasions. On the back of the report were printed directions to examining surgeons as to their duties in making reports of examinations of applicants for employment. Under the heading "Acuteness of Vision" there was an entry: "Right Eye V. 20/, Left Eye V. 20/." Under the heading "Color Sense" was the entry: "Eyes Normal." At the end of the report, just above the signature of the surgeon, he stated: "I have carefully examined the above named laborer and find that he does possess all the requirements of health, in body, mind and special senses, necessary for the position of laborer." The claimant himself testified that he had never had any trouble with his eyes prior to the accident, and that at the time of the hearing, about three-quarters of a year later, he could not see "out of" the left eye. It was this report to the admission of which the defendent seriously objected. "The report," said the court on review of the award in favor of the employee, "is the original written report"—"the regular report that is sent to the head office"—"and is a part of the regular medical reports of the railroad company. It was made in the ordinary course of the business of the railroad company and the doctor and in the regular performance of the doctor's duty, was made contemporaneously with the examination, by one having personal knowledge of the matter reported who had no motive to misrepresent the facts, but a strong motive to state them truly, and at the time of the hearing the doctor was dead. The requirements of the rule concerning the admissibility of this kind of evidence were met in the present case. The report was properly admitted in evidence." Judgment in favor of the claimant was affirmed.

PREVIOUS MEDICAL EXAMINATION OF THE INJURED EMPLOYEE BY THE MEDICAL EXAMINER AS AGENT OF THE EMPLOYER IN WHOSE SERVICES THE ACCIDENT OCCURRED

When an employee, prior to his entering upon his assigned work and prior to the happening of his alleged industrial accident, had been examined and had been pronounced healthy by a physician or surgeon acting as the agent of the employer in whose services the injury occurred, how far does such an admission against the employer's interest work in favor of the injured servant? There is a probability that the employee had been healthy in fact. Therefore, under ordinary circumstances, a medical examination made by the medical agent of the employer in whose services the employee has been allegedly injured by reason of his employment, is evidence of the facts having been as described in the statement of the doctor, made in the regular course of his professional duties and while acting as the agent of the employer. And if the doctor had pronounced the applicant for the position as healthy prior to his accident, and provided that such medical findings stand uncontradicted later on, a most favorable piece of evidence for the claimant is at his command. In Womack v. New Orleans Public Service, Inc. (17), the court's reasoning in favor of the claimant under such circumstances is clearly shown. Womack alleged that he had been injured by reason of and in the course of his employment as motorman of the defendant street car company. His injuries were described in his petition as "an extensive enlargement and induration of the right inguinal glands, very apparent upon inspection and painful on pressure, and an injury to his abdominal wall and a tendency to inguinal hernia." The claimant alleged, further, that he had been employed by the defendant after a thorough physical examination by a physician in defendant's employ who had pronounced him fit for the duties of motorman prior to his entering upon his job and prior to his accident; that he Womack, was broken in for 18 days, chiefly with pneumatic brakes, and later placed on a car operated by hand brakes; that upon the second day of his run, while operating the hand brake, he endeavored to stop the car quickly, and in pulling the hand brake, experienced a severe strain at which time he felt a severe pain in the right groin, and that he, some time later, again strained himself while trying to stop the car quickly in an attempt to avoid an accident. The defense was a general denial, and a decree was made in favor of defendant company. The plaintiff appealed from such judgment. There was no agreement among the medical experts who testified before the commission. The 2 physicians who testified for the plaintiff and appellant were of the opinion that his condition could have been caused by muscle strain, and the 2 experts for the defendant company testified that it could not. In its decision the Court of Appeals of Louisiana said: "But when Dr. Rudolphs adds: 'I have easily seen 15 cases at least' caused by strain, the scales by operation of the familiar rule concerning negative and positive testimony begin to tip toward the plaintiff. And when Dr. Wymer testifies that he gave the plaintiff 'a rigid physical examination' before he, as examining physician for the defendant company, accepted him, and that he, Womack, did not have a weakened abdominal wall or infection at that time, otherwise he would not have been employed, the scales tip a little more, for we have the word of Dr. Wymer for in so far as a rigid examination would reveal, Womack was in a normal condition when he entered defendant's employ. We have seen that the medical testimony preponderates in favor of the possibility of the plaintiff's condition being due to strain, and it is established that when he entered the defendant's employ, he was, so far as a rigid medical examination would disclose, a healthy man. We take no notice of potential systemic infection for the reasons we have given."

If we compare the Bennett case with that just discussed we find many similarities. In both cases there had been made a physical examination by a medical doctor prior to the accident, and in both cases a pre-existing disease or physical shortcoming was afterwards claimed to have manifested itself and to have culminated independently of the employment. In both cases the final result arrived at is the same. In other respects the 2 cases differ. Bennett's disease could have revealed itself by an examination of the eyes with the simple means of the ophthalmoscope and test charts, while in the Womack case a detection of a hidden infection was far more difficult. Obviously, the detectability of the disease, or of its nature, may play a rôle in deciding whether or not, and to what extent, if any, statements of prior medical examinations made by the medical agent of the employer should be rightfully used against the defendant as principal.

From the standpoint of detectability we may, therefore, distinguish between different classes of diseases:

(a) Diseases which are detected by use of the senses of the medical examiner, such as certain skin diseases, which can be seen, hernias which can be felt, and certain diseases of the bronchi and lungs which can be heard by the medical examiner.

(b) Diseases which require laboratory tests of diagnosis, such as blood tests, analysis of the urine, examination of the sputum, X-ray pictures and cardiograms.

(c) Then, a group of diseases which may not be detectable even with the aid of laboratory methods of examination, at least not always after the first examination or not for a considerable time of their existence and progress, or that may be found to exist only after repeated laboratory tests had been made. Tests of this type of diseases may show inaccurate results and findings because of imperfect technic beyond the control of the diagnostician due to some inherent weakness of medical diagnostic means, for which the physician cannot be held responsible. Thus, syphilis may remain latent for a long time; and even a blood test may not reveal any syphilitic pathology.

Should the employer be held bound by his medical agent's statement that he had found the applicant to be healthy at the time he examined him? "A series of negative tests when not the result of treatment, has, of course, more meaning than a single negative. Yet, it cannot be too strongly emphasized that patients have gone to their doom with a record of years of negative tests. Many of the gravest complications of the disease may appear and progress to fatal degenerations, especially of the nervous and vascular system, with never a hint from the blood Wassermann reaction, and persistently negative tests may reverse to subsequent irreversible positives without an apparent cause (18)." In other words, while an examination of certain systems, or parts thereof, or organs of an applicant's body, made by the doctor or a laboratory, who do not discover any pathology after an examination and prior to the alleged industrial accident, carries with it evidence that the employee had been healthy prior to and presumably up to the time of the accident, nevertheless, much depends upon the character of the disease, the means of diagnosis used, the freedom of such diagnostic means from errors which could have been avoided by reasonable care, skill and prudence of the medical man or laboratory. Therefore, not too much weight should be given to the findings of medical reports when diseases are claimed to have culminated independently of the employment, when such diseases have a tendency to remain and, in fact, remained non-manifest at the time of the medical examination made.

When the employee had been examined but once by the medical agent of the employer, or, indeed, by any medical doctor under similar circumstances prior to the industrial accident, the shorter the interval of time between the physical examination and injury suffered, the more probable that the medical findings remained the same up to the time of the industrial accident, the more likely that, in fact, the employee's state of health had not been materially changed by some intervening disease. On the other hand, the longer the lapse of time between the last physical examination and the accident, the less likely that a correct conclusion may be drawn from prior medical report as to the possibility of intervention or non-intervention of a disease of the employee.

When the employee had been examined more than once prior to his accident as when the workman is subjected to periodical examinations, the last examination preceding the employee's calamity will have more weight of evidence than any previous one. There is a greater probability that a pre-existing disease, if non-manifest, may have developed to a phase more perceptible to the diagnostic faculties of the medical examiner than before, provided that the disease is a progressive one. There is an added probability of enhanced detectability of the pre-existing disease, if any, because of the repetition of the physical examination and the increased familiarity of the medical examiner with the physical condition of the employee whom he had previously examined.

We may, therefore, summarize the different situations by saying: When an employee had been examined prior to his accident by a doctor of ordinary prudence, care and skill, in the course of his professional duties (and while acting within the scope of his agency for the employer or otherwise), and when it is alleged after an injury, claimed to have been sustained by reason of the employment, that such an injury was only the manifestation or culmination of a pre-existing disease, independent of the employment, though during the course thereof, the following conclusion ought to be drawn from the facts surrounding, and the findings of, such a physical examination: That all depends upon—

(a) the nature of the pre-existing disease, claimed to have culminated, whether progressive, dormant, or arrested;
(b) the detectability of the disease at the time of the physical examination made;
(c) the interval between the physical examination and subsequent accident of the employee;
(d) whether or not laboratory methods have been used in addition to an "ordinary" physical examination;
(e) the scope of laboratory tests, if any were made, and the possibility of excluding and avoiding technical errors by the use of reasonable care, skill and prudence of the examiner and laboratory operator;
(f) the degree of interest of the medical

examiner; the stronger the interest of the examiner to detect the disease, if detectable at all, the stronger the assumption of correct findings of such an examination;

(g) the lapse of time between the physical examination and the subsequent alleged industrial accident, or culmination of a pre-existing disease, independent of the employment. The longer the interval of time elapsed between the physical examination and the subsequent alleged industrial accident, the more likely that a pre-existing disease may have existed and culminated independently of the employment, in spite of the most rigid examination of the doctor and in spite of previous medical findings of the examiner to the contrary;

(h) the frequency of physical examinations. In case of more than one physical examination the findings of the last one preceding the alleged industrial accident should have more evidentiary value than any prior one because it may be assumed that a pre-existing disease, if progressive and existing at the time of the last examination, had become more perceptible to the senses of the examiner, or to laboratory tests.

BIBLIOGRAPHY

1. Southern Casualty Co. v. Flores, 1 S. W. (2nd) 260 (1928) reversing 294 S. W. 932 (1927).
2. Ruling Case Law, Supplement. Edit., 1932, vol. 28, p. 755, sections 50 et seq.
3. Indian Creek Coal Mining Co. v. Calvert, 68 Ind. App. 474, 119 N. E. 519 (1918); Frederickson v. Ind. Acc. Com. of Utah, 68 Utah 206, 249 Pac. 480 (1926); Moschogian v. Concrete Material & Mfg. Co., 179 Minn. 177, 228 N. W. 607 (1930).
4. Indian Creek Coal & Mining Co. v. Calvert, 68 Ind. App. 474, 119 N. E. 519 (1918); Kingston Pocahontas Coal Co. v. Maynard, 209 Ky. 431, 273 S. W. 34 (1925).
5. Cole v. Dept. of Labor & Industrial Rel., 137 Wash. 538, 243 Pac. 7 (1926); Swett's Case, 125 Me. 389, 134 Atl. 200 (1926).
6. North Elk Oil Co. v. Ind. Acc. Com., 81 Cal. App. 582, 254 Pac. 582 (1927).
7. Texas Employers' Insurance Ass'n. v. Shipley, Tex. 260 S. W. 646 (1924); Rockford Hotels Co. v. Ind. Com., 300 Ill. 87, 132 N. E. 759 (1921).
8. Nelson v. Industrial Insurance Dept., 104 Wash. 204, 176 Pac. 15 (1918).
9. Raina v. Standard Gaslight Co. of N. Y., 193 N. Y. App. Div. 54, 183 N. Y. S. 264 (1920).
10. Tice, F.: Practice of Medicine. New York, W. F. Prior Co., 1920, 4, 561.
11. Robinson-Pettet Co. v. Workmen's Comp. Board et al., 201 Ky. 719, 258 S. W. 318 (1924); Jessie Smith v. Mason Bros. Comp. and Others, 174 Minn. 94, 218 N. W. 243 (1928); Fraze v. McClelland, 200 Iowa 944, 205 N. W. 737 (1925).
12. Peoria Ry. Terminal Co. v. Industrial Board et al., 279 Ill. 352, 116 N. E. 651 (1917).
13. Farrow v. What Cheer Clay Products Co., 198 Iowa 922, 200 N. W. 625 (1924).
14. Federal Mutual Liability Insurance Co. v. Ind. Acc. Com., 111 Cal. App. 269, 295 Pac. 379 (1931).
15. Balzer v. Saginaw Beef Co., 199 Mich. 374, 165 N. W. 785 (1917).
16. Royal Indemnity Co., et al. v. Industrial Com., et al., 88 Colo. 113, 293 Pac. 342 (1930), rehearing denied.
17. Womack v. New Orleans Public Service, Inc., 5 La. App. 71 (1926).
18. Stokes, J. H., and O'Leary, P. A.: Modern Clinical Syphilology, Diagnosis, Treatment; Case Studies. Philadelphia, W. B. Saunders Co., 1926, p. 90; Hazen, H. H.: Diseases of the Skin. St. Louis, C. V. Mosby Co., 1927, p. 288.

The Individual in Medical Teaching.—We have been passing through a period of extravagance in physical building, in palatial halls, laboratories, libraries, and clinics. Not that it is to be decried, since we are better off for these things and would not give them up, but it has been comparable with the extravagance usually indulged in by the newly rich, who tend first to provide physical luxuries before cultural.

Neither can it be said that considerable attention has not also been paid to improvement of teaching personnel, even to the point of extravagance in some ways, but by and large we have seen the first attention to bricks instead of brains, to marble rather than men. Even in the accomplished improvement in personnel the very methods of "standardization," which have so largely taken charge of our whole civilization, have perhaps been guiding principles. The individual, the person, his qualities, and his needs, have not had the first consideration.

My thesis here is that we would be better off to seek primarily men to build such teaching and working quarters about as could be afforded, rather than as something of an after-thought looking for men to place in monuments, the cost of which has consumed a disporportionate amount of the capital; that endowment of individuals should be more productive than endowment of halls or even of institutions; and that there is need of emphasizing the importance of the individual and individual opportunity, not as opposed to but superimposed upon the present emphasized "standardization."—Kenneth M. Lynch, M.D., LL.D., *The Diplomate*, 1933 (March), 5: 101.

MEDICAL ANNALS

of the

DISTRICT OF COLUMBIA

Editorial Office, 1718 M Street

EDITORIAL STAFF

Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication

Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D. C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D. Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1933–34

President	Prentiss Willson, M.D.
1st Vice President	Daniel LeRay Borden, M.D.
2nd Vice President	Margaret M. Nicholson, M.D.
Secretary-Treasurer	Coursen B. Conklin, M.D.

PROFESSIONAL UNITY

The organized medical profession in the District of Columbia has been confronted with problems equal in magnitude to, but differing somewhat from, those that have had to be solved by other component societies of the American Medical Association. This is an era in which it would seem that former standards of practice and former principles of professional conduct are in many instances no longer applicable. The rise of contract practice and the widespread activities of our national government in competing with the private practitioner by giving medical care through the agency of government doctors, not only to veterans with non-service connected disabilities, but to numerous members of families of former service men, are familiar enough to all. The government hospitals in Washington, it would seem, have been most generous in extending to officialdom the excellent facilities that are available. Often it must have been that the hospital admitting officer would have to go through much mental gymnastics in entering on the patient roster the various classes of officials and their wives and sons and daughters, and other relatives more remote, under the proper article and section of the generous law as it stood. The Workmen's Compensation Act, which in Washington functions through a law with a rather non-euphonious and far-fetched title, "Longshoremen's and Harbor Workers' Compensation Act," has caused many problems to arise. Workmen's compensation clinics have, as has been well known, brought forth many a bone of contention. Of particular note has been the competition afforded the physician-controlled clinics by the lay-controlled workmen's compensation clinics. The new rush by clinics for "business" has brought into being a species of go-getter unknown to the activities of individuals or groups of individuals in the practice of medicine even a decade ago, forsooth a solicitor,* who must bring in new business from insurance companies or business firms to gain his employer's approbation and, what is more important to him, his continuance in the job. The competition of the clinic or insurance doctor with the private physician in the care of the private physician's *own* patient has caused ominous rumblings and general disquietude. Another problem is a direct result of the failure of so-called business leaders, inclusive of bank executives and controllers of large industries, to function as they should. The wants of the indigent patient, it is a credit to the profession to state, have been taken care of in the past. With the sharp downward revision of incomes of the physician coincident with the business depression which came through no outstanding fault of his own, he is immediately confronted with the extending of professional care and even succor to a large number of the jobless. In the

* See Principles of Medical Ethics, A. M. A., Chapter II, Art. I, Sec. 4; Also, Code of Ethics recently revised and agreed to by the 5 County Medical Societies of Greater New York; "Advertising—*Section 22e:* The employment of agents as contact men or solicitors of business, or the subsidizing of any one for the purpose of steering patient is prohibited." (Bronx County Medical Bulletin, 1933, **11**, 119.)

distribution of moneys for the care of the millions without jobs, both in and out of institutions, there has been generally a total silence concerning the payment for medical service.† There has been a tacit understanding, even on occasions an expression of sentiment by individuals and organizations busied in the distribution of money collected from the citizenry, inclusive of the physicians, that medical care should come gratuitously. Apparently no reason can be seen why the governmental agencies and board of directors of charitable and quasi-charitable organizations should reimburse the doctor for his gasoline consumption and tire upkeep, in the making of long-distance, time-consuming calls.

A problem that so-called organized medicine has had to solve, which is indigenous to all organizations, is the accomplishment of unity of effort. In a learned body whose members are seriously concerned with the development of professional skill and of preventive methods of disease control, individualism is bound to develop. It is very well to attend night after night medical society meetings at which are read papers with much professional merit. It is very well in a city such as Washington to be a member of 3, 4, or 5 of the 19 smaller medical societies, to be an active member on hospital staffs, and to do everything that may be done to combat disease. Indeed, all this is expected; an expenditure of time and effort that is unequalled in any other calling. The national death rate decline may be well considered as one of criteria in gaining knowledge of the success of the physician's effort. Some 10 years ago the death rate per 1,000 was 12. 1932 found a decline of something like 20 per cent, to 9.6 per 1,000. Surely the medical profession can feel some gratification in these results. All the attentiveness to purely professional effort thus disclosed has not been accompanied with the financial security that should be possessed. Further effort in an entirely different channel would seem indicated. The very basic economic structure on which the physician has heretofore depended for a proper living for his family and himself, seems threatened with being swept away in a flood of forces originating in the backwash of socialistic ventures. Indeed in the formation of new creatures in the practice of medicine cited above, fundamental principles of ethics seem lost. In facing the present situations, highly skilled leadership is necessary. Skilled leadership without united support cannot help but fail. Our 19 local smaller medical societies, some of which are but recently organized, some dating back 60 years and more, are all altruistic in their purposes of organization. They are essentially limited groups of kindred souls brought together for the promulgation of medical enlightenment and enjoyment of social contacts. All are loyal members of the Medical Society of the District of Columbia. A directing of effort and an awakening stimulus such as our present common problems are all that are needed. To the members of the Society and the members of the smaller societies in particular, we say, attend the business meetings on the first Wednesday of each month; there will then be marshalled together potentialities capable of much good. You will aid the composite mind of the profession to function.

The true physician, as a matter of course, will never be primarily interested in his own financial betterment, but his self-respect should demand a livelihood fitting for a member of a great learned profession. The Medical Society of the District of Columbia must ever be aware that its own interests, although in general similar, are often widely different from the component societies in the States. The doctor in many communities is confronted with magnificent distances to traverse. We never can operate as a detached unit but always as a part of the larger and well-organized national body. What we have shown should be the attitude of the smaller medical society membership, we, as representatives of medicine in the District of Columbia, should acquire in connection with the American Medical Association. A practical way is to read carefully what the House of Delegates are considering—to learn what action the Board of Trustees are contemplating; then, after mature judgment, give our delegate specific instructions. As residents of the city of Washington we are indeed in a strategic position to aid, if we act concertedly, if we keep in step with the profession. Finally, bear in mind the words of Dr. H. A. Fowler in his presidential address, "The adjustments to changing times must not cause the sacrifice of the high ethical and professional concepts which have grown up through the centuries and which have become a vital part of medical art."

---

† This and allied problems of medical economics are now under consideration by a specially appointed committee, the chairman of which is Dr. Thomas A. Groover. Past Presidents Willam H. Hough, H. H. Kerr, Oscar B. Hunter, Charles S. White, Joseph S. Wall, John D. Thomas, H. C. Macatee and Francis R. Hagner are members.

UNLICENSED PRACTITIONERS

One of the serious situations which confront those who are interested in the maintenance of public health is that of the unqualified, unlicensed individual practicing medicine. Attention has recently been called to a flagrant violation of law in the city of Washington. A man without a license appears to have been allowed to treat patients in various hospitals, having all the rights and prerogatives of a licensed M.D. A sign on his office proclaimed his readiness to take care of all manner of human ills. Cognizance of this happening is said to have been taken by the Commission on Licensure and the law governing the situation will be enforced. From the apparent ease in which this individual practiced, it would appear that there may well be a number of similar violations. For the promotion of public health, as well as for the protection of regularly licensed practitioners of medicine, members of the Society should be on the alert, reporting promptly both to Dr. William C. Fowler, Secretary-Treasurer of the Commission on Licensure and to the Medical Society's Office, 1718 M Street, any violations of the Healing Arts Practice Act. The Executive Committee, acting for the Society, wants to do everything possible to aid in bringing offenders to justice.

NATIONAL INDUSTRIAL RECOVERY ACT

Recent issues of the Journal of the American Medical Association have expressed what should be the viewpoint of every physician in practice. We quote below from the Journal, August 12, 1933, p. 526:

(*It is hoped that every physician will enter wholly into the spirit of the National Recovery Act as an ideal, representing the government's point of view as to the principles and motives behind which the entire nation must unite if it is to pull itself out of the slough into which it has fallen. . . . The Journal would urge physicians in all their relationships to enter fully into the spirit of the legislation, recognizing its experimental character but realizing that the times demand experimentation by the trial and error method if a solution is to be found for what has seemed in the past a most difficult problem.*)

The Medical Society of the District of Columbia, a scientific body obtaining a charter through a special act of Congress, maintains an office and hopes to be able to conform with the President's reemployment agreement authorized by Section 4a of the National Industrial Recovery Act. We are in hearty sympathy with the production of more opportunities for gaining work and all of the movement's humanitarian phases. Formal action will be taken at the coming meeting of the Executive Committee, bearing in mind, ". . . . *a professional man or organization and a non-profit organization of any kind are under no legal duty to formulate and adopt a code of fair practice or to sign the President's reemployment agreement. With them the adoption of codes and the signing of the agreement are matters of circumstance and of patriotism. Whether a physician will or will not sign the President's reemployment agreement and display the official emblem in his office, on his automobile and elsewhere may, of course, be determined by the local medical organization in each community. . . .*" (Jour. A. M. A., Aug. 26, 1933, p. 715.)

CALENDAR, MEDICAL MEETINGS

September 17–23, inclusive: MAYFLOWER HOTEL. REGULAR SEPTEMBER MICROSCOPIC, ORAL CAVITY, BONE DIAGNOSTIC DEMONSTRATION, by Dr. J. C. Bloodgood and staff. All members of the Medical Society of the District of Columbia are invited to attend and to participate in the demonstration. Anyone who wishes to present a case at any of the demonstrations should notify Dr. Charles F. Geschickter, Laboratory of Surgical Pathology, Johns Hopkins Hospital, Baltimore, Md., in time to have the case properly assigned in the program. It is necessary that the case be put in lantern slides—whether it be photographs, X-ray films, gross or microscopic pathology.

September 25: Meeting of the Executive Committee of the Medical Society of the District of Columbia, 8 P.M.

October 4: Business meeting.

October 11: Davidson Lecture. "X-ray Treatment of Bone Conditions Produced by Hyperparathyroidism." Dr. E. A. Merritt. Buffet supper will follow. *Special notice* should be taken of this event. Invitations should be sent to your medical friends, not only in Washington but elsewhere, to be in attendance on this evening.

November 14-17: Twenty-seventh Annual Meeting, Southern Medical Association, Richmond, Virginia.

TUMOR REGISTRY

Through action of the Society on May 3, 1933, the maintenance of a registry in the Society's Building was authorized. The President, Dr. Prentiss Willson, has appointed the following to serve on the committee which will have charge of this new activity:

To serve 3 years:
Janvier W. Lindsay, Chairman
Walter Freeman
Matthew White Perry

To serve 2 years:
James A. Cahill, Jr.
Edmund Horgan
Claude Moore

To serve 1 year:
F. J. Eichenlaub
V. J. Dardinski
H. H. Leffler

FACULTY CHANGES AT GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE

DR. G. H. HANSMANN, NEWLY APPOINTED ASSOCIATE PROFESSOR OF PATHOLOGY

A recent addition has been made to the Department of Pathology at Georgetown University School of Medicine by the appointment of Dr. G. H. Hansmann as Associate Professor in that branch. Dr. Hansmann was born on March 6, 1890 at Manson, Iowa. After graduating from the High School of that town he completed his pre-medical requirements in the University of Iowa, entering the College of Medicine in 1914, where he was graduated in 1918. Because of his outstanding undergraduate work and professional promise before graduation, he was elected to an associate membership in the Sigma XI. In 1918 and 1919 we find him as clinical chemist at the University Hospital in Iowa City where he remained until 1921, when he became instructor in pathology at Harvard Medical School and later resident pathologist at the Peter Bent Brigham Hospital. Since 1924 he has been connected with the University of Iowa in the capacity of pathologist at the hospital and associate professor in the Medical School.

Dr. Hansmann is a member of the following societies: Johnson County Medical Society, American Medical Association, American Association of Pathologists and Bacteriologiste, Society for Experimental Biology and Medicins, Sigma XI, Alpha Omega Alpha Honorary Medical Fraternity, and Phi Beta Pi Social Medical Fraternity.

Dr. Hansmann has published 24 articles which have appeared in the leading medical journals of this country.

Resignation of Dr. Gannon

Dr. James A. Gannon, after teaching for 25 years in the Department of Surgery of the Georgetown University School of Medicine, and after having served for 15 years as Attending Surgeon at the Georgetown University Hospital, has resigned from these positions.

GEORGE WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

Newly Appointed Full-Time Faculty Members

Edward Bright Vedder, A.M., M.D., D.Sc., becomes Professor of Experimental Medicine and Executive Officer of the Department of Pathology. Colonel Vedder was the director of the Army Medical School since 1930. He is known for his work as senior member of the Army Board of Medical Research and his accomplishments in the field of preventive medicine. He obtained his degree of M.D. from the University of Pennsylvania in 1902. The honorary degree of D.Sc. was conferred upon him by the University of Rochester.

James Leslie Snyder, M.S., M.D.: Instructor in the Department of Pathology.

William Henry Waller, Ph.D.: Instructor in the Department of Anatomy.

John Ralston Tate, M.D.: Teaching Fellow in Anatomy.

Juanita Thompson, M.D.: Research Assistant in the Department of Experimental Medicine.

Dean Earl Baldwin McKinley, during the past summer, travelled extensively in Europe in the gathering of preliminary data for a world survey of tropical diseases.

Francis Hannibal Miner, M.D. (Seniority Number 187), was born July 14, 1864 at Philadelphia, Pennsylvania. He was graduated from Georgetown University School of Medicine in 1895. Dr. Miner became a member of the Medical Association of the District of Columbia on April 9, 1896, and of the Medical Society of the District of Columbia on October 1, 1902. His death occurred in Washington on August 13, 1933.

Dr. Gregg C. Birdsall has been appointed chairman of a special committee to draw up appropriate resolutions.

John Van Rensselaer, M.D. (Seniority Number 126), was born April 4, 1862 at Belleville, N. J. He received the degrees of A.B. and A.M. at Hobart College, New York, in 1882 and 1886, respectively. He was graduated in medicine from Columbian University in 1889. Dr. Van Rensselaer became a member of the Medical Association of the District of Columbia in 1892, and the Medical Society of the District of Columbia in 1893. He served on the Executive Committee of the Society for 4 years and was 1st Vice President in 1909. His death occurred at Kittery, Maine, on July 8, 1933.

Committee on resolutions: Drs. James A. Gannon, Chairman; E. A. Balloch; A. L. Stavely.

BOOK NOTICE

Medical Relations under Workmen's Compensation—*A Report Prepared by The Bureau of Medical Economics, American Medical Association:*

Such vital problems as are involved under the compensation act "as the choice of physician, the character of service rendered under various conditions, the amount and form of payment and the different methods of organizing the medical service," are dealt with in some 150 pages. Chapters on "Professional Relations in Compensation," "Compensation as Origin and Fosterer of Contract Practice," give much incite into the causes of unrest in the ranks of practitioners. An appendix with fee schedules compiled from various states is of interest, as a comparative study of values placed upon various procedures in different communities. The book has a copyright, 1933, and is obtainable from the American Medical Association, Publishers, 535 North Dearborn Street, Chicago, Illinois.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II | OCTOBER, 1933 | NUMBER 10

CONSTITUTIONAL FACTORS IN THE NEOPLASTIC DISEASES*

TRUMAN ABBE, M.D.
Washington, D. C.

At this first joint meeting of this Society and its new Section on Neoplastic Diseases it might interest you to learn what its founders thought would justify the creation of this Section. They realized that all of you were dissatisfied with the results gotten in the treatment of your cancer patients. Not only do most of them keep on dying in spite of the best efforts of the surgeons and the radiotherapists, but the surgeons are hard to convince that radiotherapy offers anything better than surgery, and the radiologists are equally sure that surgery can do little more than radiotherapy. Moreover, the internists say that neither the surgeons nor the radiologists get results enough better than internists get, except in the earliest stages, to justify turning the patients over even temporarily to either the surgeon or the radiologist; and in those early stages the diagnosis is doubtful. The pathologist says we should let him make the diagnosis in those early stages, but in those early doubtful cases the pathologist hedges and does not give us a positive diagnosis at the time we need it most. It was deemed essential to face these differences of opinion squarely, and such a Section as this would bring those interested together for this purpose.

To the chairman, Dr. Eugene R. Whitmore, is due the great credit for the selection of the name of this Section on Neoplastic Diseases, a name chosen with deliberate forethought to bring and keep before us the newer concept; to help us get away from the ideas of cancer as taught to the older and perhaps still to most of the younger members of the profession; to help us get away from Hippocrates' concept of "Cancer," the crab; and to help us keep in mind Ewing's concept of the neoplasms as definite diseases—a distinct group of diseases having in common one feature, a mass of new tissue, but the individuals of the group no more related to one another than the different individuals of the infectious diseases. These neoplastic diseases are probably no more related than diphtheria, pneumonia, and mumps; and what confusion there would be in our minds if we were trying to find a common cause and a single cure for pneumonia-diphtheria-mumps!

With this conception of neoplastic diseases before us, some of the promoters of this Section dream of it as one largely of research. Each of the Sections of your Society has its research problems, but while cancer is as old as the oldest historical writings, the conception of the neoplastic diseases began to spread only 14 years ago with the publication of the first edition of the book by Ewing. To him we owe certainly the spread of the conception of new growths as many distinct diseases, each with its own distinct etiology, each with its characteristic symptoms, each with its own peculiar pathology, and each deserving characteristically appropriate treatment. Ewing has taken us away from the thought that there might be a single cause for cancer or a single cancer cure. He has shown that each neoplastic disease has its own cause and its own cure.

---

* Read at the joint meeting of the Society and the Section on Neoplastic Diseases, May 17, 1933.

With only 14 years of this concept behind the leaders in this field you see why your infant Section may well have more than its share of research problems. You know that you are going to hear discussed many heresies, many conflicts with the teaching most of us had in school. All of our ideas are being revised day by day, and of course we do not agree amongst ourselves. Moreover we need the ideas of each of you who is interested enough to think along the lines of the neoplastic diseases. We need light from all the sidelines known to the younger men, we need the experience of all the older men who have watched these patients go through the various stages of these diseases. We are all just beginning to formulate presentable ideas. We do not ask anyone to accept our tenets as final. We merely ask you to think about them, discuss them with us, help us to find and discard their fallacies, to find and establish their truths. The promoters of this Section want you to feel that it is merely one part of your Society, that to make it a success, to save the lives of those now dying from the neoplastic diseases, your thoughts are needed.

After this preamble I should like to present for your consideration some of the constitutional factors in the neoplastic diseases, as bearing on their classification, etiology, diagnosis, pathology and treatment. In the preamble I spoke for the promoters of the Section. From now on I exonerate all others from guilt in the heresies to be uttered.

The broadest of all constitutional factors is masked in the term "inheritance." What the present patient has inherited from previous generations is not only the evident bodily characteristics shown in the body build, the facial appearance, the shape of the nose, the color of the eyes, the texture of the skin, but also the obscure physiological controls, the activity of the thyroid and the parathyroid, the efficiency of the pancreas and of the spleen. When I speak of heredity I think not of the inheritance of a group of cells but of the inheritance of the factors which control the growth of those cells, and the growth of the other tissues in the body. In the neoplastic diseases the one person who has established inheritance beyond question is Maude Slye. She has carried her studies through over a thousand generations of mice. There is now no doubt that heredity is a factor in mouse neoplasms. In human neoplasms how could we get comparable statistics? In how many of your patients can you show diagnoses controlled by necropsy for two generations or even for one? What, then, must we accept for man? Must we not be satisfied at present with the instances of multiple occurrence of a neoplastic disease in one generation and the partial record of two or three generations? When we find retinal glioma in 10 out of 16 brothers and sisters, what must we say? Ewing quotes such a record. I have one family in which of 8 children that lived to adult life, 4 have died of epithelioma of the face, and 2 others still living have had keratoses of the face that healed under radiotherapy, making practically 6 neoplasms of the same nature in 8 brothers and sisters. I have another family in which the mother and 2 daughters (there were no other children) all had carcinoma of the breast. In another family the mother died of what was called ulcer of the stomach. Three of her 8 children have had carcinoma of the colon. I am sure these histories can be duplicated in the practice of many of you. I cite them merely to recall to your memories the evidence in your own practice that certain neoplastic diseases seem to be hereditary in man as well as in mice. Do not conclude from this that all neoplastic diseases must be hereditary. I am limiting the heredity to certain diseases in which the evidence is at hand.

I have another family that has been very illuminating to me. A small boy, aged 5 years, who developed sarcoma of the round ligament of the liver, was operated on and died. At that time there was no history of a neoplasm in his family on either side for 4 known generations. Four years later the boy's paternal grandfather, aged 76 years, developed a melanosarcoma of the skin and died. Eight years after that the boy's father died of teratoma of the testis at the age of 52 years. Eventually we had the inheritance evidence built up for us through 3 generations; but further, the grandfather had resisted the invasion of the disease until he was 76, the father had escaped until he was 52, while the small boy succumbed at 5 years. Is it fair to see in the succeeding generations of that family a decreasing resistance to the invasion of that neoplastic disease?

Before you answer that question may I recall to your memories a group of diseases that for a number of years I have been thinking of as "Actinomas?" The name was coined to suggest the neoplasms produced by the actinic rays in the skin of certain people. The group is exemplified most commonly by what are popularly called "sailors' and soldiers' cancer," multiple epitheliomas of the face and hands occurring in people who live outdoor lives, in the sunshine many hours in the day. It occurs most frequently in the men with light hair, blue eyes, pink and white skins of the characteristic Anglo-Saxon type. It is rare in the oily-skinned, dark-haired latin races. The type of skin is, of course, inherited. In this Anglo-Saxon stock, and possibly elsewhere, also since the records of stock in the human race are not very accurate, there is the occasional child that develops the rather rare disease xeroderma pigmentosa. In these xeroderma patients the skin is extremely sensitive to light. As soon as the child begins to get out from behind the protection of the window glass, along in his second year, there appear first freckles, then multiple keratoses, and then the epitheliomas that eventually carry off the child. Usually the patients die before they are 10 years old, some live into their teens, and occasionally they live into their twenties. Do we not here in this group of actinomas have a demonstration of decreasing resistance to one neoplastic disease? First the immune latin races, then the susceptible Anglo-Saxon race in whom the epitheliomas of the face and hands occur in adult life, usually in the later decades, sometimes in middle life; while the very susceptible individuals are found in the xeroderma cases that are all affected in childhood, a few living to maturity, but more succumbing before they are 10 years of age. Do you think the idea of increasing susceptibility in succeeding generations is new and radical? Yet do not all of us concede that in general the older a patient is when he develops any neoplastic disease the longer the course of the disease is apt to be, and the younger the patient when the disease becomes manifest, the more rapid the course? And if we are asked why the younger patient has the shorter course, do we not reply, "Because the younger patient has less resistance"? Is it then at all radical to suggest that there may be a decreasing resistance or an increasing susceptibility, whichever you choose to call it, in succeeding generations that is hereditary? Again we are limiting this increasing susceptibility to certain neoplastic diseases, not extending it to all. There is another constitutional factor suggested by these actinomas. They represent the special susceptibility of one tissue, skin epithelium. Can we not find other instances of a single tissue throughout the body that is prone to develop neoplasms? Of course there are the lymphosarcomas, the group that Ewing thinks of as "systemic sarcomas," the miscellaneous group of lymphosarcomas, lymphogranulomas, Hodgkin's disease, the leukemias, chloroma and multiple myeloma. In all of these are we not very apt to find a single tissue throughout the body involved, and, moreover, are we not very apt to find constitutional symptoms very early in the disease? There is the fever in Hodgkin's, the albumosuria in myeloma, the systemic enlargement of lymph nodes in lymphosarcoma, the anemia in chloroma, and the white blood cell changes in the leukemias. We merely mention these constitutional symptoms of these neoplastic diseases that have been confusing our minds while we have been trying to build our conception of cancer around a local area of cell growth, while we have been thinking of the local manifestations as the main feature of the neoplastic disease. If we can shift our conception of the incipiency of the disease to the whole tissue, will we not perhaps make faster progress? We all know full well that a local factor in determining the site of the first appearance of a neoplasm is frequently very clear.

What could be clearer than the localizing effect of the clay pipe in epithelioma of the lip, the ragged tooth in epithelioma of the mouth, the soot imbedded in the skinfold of chimney sweeps' cancer, the hot charcoal brazier in kangri cancer, the laceration in certain carcinomas of the cervix uteri? But on the other hand in the systemic sarcomas and the multiple myelomas a whole tissue throughout the body is involved early, if not at the beginning of the disease, and, furthermore, that one tissue may remain the only tissue involved to the end of the disease.

If you will go a step further you will all call to mind instances in which there were multiple bony metastases following hypernephroma or carcinoma of the thyroid, the prostate or the breast. You may be able to recall as I do instances in which practically every bone was involved as confirmed by autopsy but no other tissue. When the osseous system shows all the metastases, what other explanation can there be except the blood distribution of the cancerogenic element with a special susceptibility of the bony tissues and an immunity, at least a relative immunity, of the other tissues? Must there not be systemic factors determining the localization of the metastases? That susceptibility of the osseous tissue you have all pondered over. And have you not put in the same category in your minds the infrequency of metastases in certain other tissues? The infrequency of metastases in the muscle tissues is certainly noteworthy. And then there is the spleen. Although the liver shows metastases very frequently, the spleen seems to be practically immune, if we except the neoplasms that are primary in the reticulo-endothelial system, the lymphosarcoma group. Must we not then admit the existence of a single tissue susceptibility and special tissue immunity probably of varying degrees in different neoplastic diseases and in different individuals?

Further there has come to us in the past few years another new light on the neoplastic diseases, linking at least certain of them with that physiological neoplastic process, pregnancy. In his early reports on the Aschheim-Zondek reaction, Zondek commented on one of its pitfalls. While the reaction was positive in most of the cases of pregnancy, it was also positive in over 80 per cent of cases of genital carcinoma, and in over 35 per cent of extragenital carcinomas in women. Only when carcinoma had been ruled out was the Aschheim-Zondek reaction for pregnancy reliable in 98 per cent of the cases. That pitfall for obstetrical diagnosis has given the first and so far the only reliable constitutional test for a neoplastic disease. The gynecologists promptly showed the application of the test to chorionepithelioma and developed the test until it is not only qualitative but quantitative. The progress of the neoplasm towards cure or further invasion can be followed by the sensitiveness of the Aschheim-Zondek reaction. Furthermore, within the last 3 years Ferguson and his co-workers have shown that this reaction is positive in men with teratoma of the testis, not in all neoplasms of the testis, but specifically in teratoma, and here too the reaction is in proportion to the invasion of the disease. So now we have grouped together 3 neoplastic conditions, the physiological neoplasia of pregnancy and the 2 neoplastic diseases, chorionepithelioma and teratoma testis. It is worthy of note too that the rare chorionepithelioma in men even when there are no signs of trouble in the testis have been reported this past year as giving a positive Aschheim-Zondek reaction.

Just here may I call to your attention those unusual but well authenticated instances in which a neoplastic disease with metastases in distant portions of the body, the diagnosis confirmed by section, does for some obscure reason cease to grow, regress, and finally disappear. The patient gets well to die of some other disease. The cases are rare but they do occur. The most frequent of them are chorionepitheliomas. Ewing collected records of 15 such cases. There are also a number of instances of sarcoma of various organs. Then there are some cases of carcinoma of the breast with metastases that have regressed, part of the nodules disappearing, the patient improving greatly but succumbing eventually to the neoplasm. How can one explain such instances except through the development, local or general, of an immunity to the neoplastic disease? Very similar to these cases of spontaneous regression of neoplasms are the instances of neoplasms under treatment with radiotherapy in which metastases in areas that have received very little or no direct radiotherapy disappear along with the other nodules that have been thoroughly treated. Must there not have been some constitutional reaction to produce the absorption of those distant metastases? Then there is the other side, illustrated by the cases under treatment with radiotherapy that, after improving most encouragingly for months, after some one treatment, have a sudden widespread appearance of new nodules. Must not this shower of new nodules represent a sudden loss of resistance? Is it not an evidence that there is some constitutional upset? Do we not see the same effect at times following operation, following pregnancy, following an acute infectious disease like influenza? Is it not our problem to get at the bottom of these at present unexplained constitutional changes which we recognize in our neoplastic diseases? Must we not learn how to repeat the encouraging episodes and to sidetrack the unfortunate ones?

Attempts to reproduce the regression of neoplasms by constitutional treatment have long been sought. Perhaps the most widely tried have been those of the school of radiotherapists who instead of trying to give lethal dosage of roentgen rays to each portion of a neoplasm, have given lesser dosage over considerable areas outside of, as well as directly over, the local lesions. Perhaps many of the good results from radiotherapy might be attributed to these constitutional effects as well as to the local lethal effect. How could the efficiency of each factor be isolated? And further, may not the lethal dosage on the tumor itself, which produces liquefaction of the mass or even mere destruction of the nuclei of the neoplastic cells destroying the neoplastic tissue, be effective constitutionally? May not the absorption of those destroyed cells be as efficient in producing the good results which follow radiotherapy as the destruction itself of the cells? If we recall for comparison the treatment of agranulocytic angina by the pentose nucleotides, a nuclear protein which injected subcutaneously produces constitutional effects that have given the greatest number of cures yet produced, and recall further that the next best line of treatment is radiotherapy, which has its main effect upon the nuclei of the cells exposed, is it too great a stretch of the imagination to think that the roentgen rays possibly produced pentose nucleotides in the tissues? And, if this biochemical explanation of the effects of the roentgen rays on the tissues is true for agranulocytic angina, may we not hope for a similar biochemical explanation of the effects of the radiotherapy in the neoplasms? And just one more thought there, is it not the neoplasms with the greatest mass of nuclear tissue that are most affected by the roentgen rays? We know that we have proved nothing by this speculation in the realm of biochemistry in radiotherapy, but we believe the hypothesis worthy of thought and investigation.

Another approach to the attempt to produce regression of neoplasms has been through the endocrines. The work of Coffey and Humber with suprarenal cortex a few years ago received great publicity, then fell into disrepute. Attempts of others to confirm the results and to get cures were most unsatisfactory. But the liquefaction of certain neoplasms under their treatment was clear and has been confirmed by others. Further work with endocrine treatment that deserves notice is also being done. The growth of certain tumors in mice and rats is being modified by endocrine injection. Susman reports the regression of 7 human neoplasms, the only ones he has attempted, following combined dietetic treatment and injection of posterior pituitary and theelin. I am not advocating the use of endocrines as cancer cures, but am calling your attention to lines of work that are being thought out and tried as constitutional treatment for the various neoplastic diseases.

Closely allied with these endocrine treatments are the conceptions of variation in carbohydrate metabolism associated with the neoplastic diseases. An undue proportion of neoplasms are associated with high blood sugar. What does it mean? Adrenal upset? Pituitary dysfunction? Abnormal pancreatic activity? Again the growth of neoplasms in many instances is more rapid following operation of merely an exploratory character. Frequently we attribute such spread of the disease to displacement of tumor fragments by manipulation during the operation, but there are at least 2 other factors that may well be taken into consideration as increasing the effect of the operation. First, prolonged deep ether anesthesia distinctly increases the glucose content of the blood. Sometimes the excess of blood sugar is so great that it leaks over into the urine after operation. This extra glucose may be like the extra glucose in the cases of the neoplasms. It may be a factor in the increased rate of growth, or the upset which produced the high blood sugar after the anesthetic may also be a factor in increasing the rate of growth of the neoplasm. Second, loss of blood seems to stimulate general tissue metabolism and also neoplastic growth. I have in mind one patient with a teratoma of the testis in whom attention was directed to the tumor mass in the first place following his giving blood as a donor for a transfusion. And on two subsequent occasions when he acted as donor before the diagnosis of his condition was known immediately after the withdrawal of a pint of blood from his veins he noted a rapid increase in size of the growth.

Now, is not one of the first of our problems that of establishing a new conception of the neoplastic diseases based on the clinical course, on endocrine physiology, on known factors in etiology, on response to radiotherapy, as well as on the cell picture? Must we not drop the study of "Cancer" and attempt to write the story of each individual neoplastic disease? And then, if we admit that there are constitutional factors present in the neoplastic diseases must we not consider our present day treatment based on the local manifestation and aimed at local eradication, the treatment by surgery and lethal dose radiotherapy, as merely symptomatic treatment of the necessity? Is not the treatment in use today far from the ideal treatment? Of course, we have got to continue our local removals or destructions. They are the best treatment that we have today. But should not all of us keep our eyes on the ideal constitutional treatment of each one of the neoplastic diseases, one at a time? It will be many, many generations before we can hope to breed out the strains of susceptibility to the neoplastic diseases even after they have been located. The cold, blood-mating of human beings for the benefit of the race might be partially possible under some form of controlled government, but to dream of limiting all children born to those physically desirable is assuming that the board of censors has the foresight of the Creator as well as his omnipotence. And pending the arrival of the millennium, is it not up to us to do more research on constitutional therapy?

I have endeavored to gather together some stray facts that most of us have long known in support of the view that there is an hereditary factor in some of the neoplastic diseases, that in certain of these neoplastic diseases there is an increasing susceptibility in some descendants of succeeding generations. I have presented some arguments in favor of single tissue susceptibility. I have emphasized the regrouping of some of the neoplastic diseases as shown in their response to endocrine reaction, have recalled to your attention certain neoplastic diseases that regress spontaneously and have raised the hope of constitutional treatment as the ideal towards which we must work. I have raised only controversial questions, heresies, for all of us to think over. The problems are difficult and for many years will need the thoughts of every one of you. Bring your questions to the monthly Section meetings and let us all try to solve them together.

BIBLIOGRAPHY

Bischoff, F., and Maxwell, L. C.: Hormones in Cancer; Effect of Ovarian, Splenic, and Adrenal Extracts upon Rat Sarcoma No. 10. J. Pharmacol. & Exper. Therap., 1930, 40, 97.

Cantarow, A., and Gehret, A. M.: Ether Hyperglycemia with Especial Reference to Hepatic Disease. J. A. M. A., 1931, 96, 939.

Coffey, W. B., and Humber, J. D.: Extract of Adrenal Cortex Substance; Report of its Preparation and Use, with Some Clinical Notes. California & West. Med., 1930, **33**, 640.

Ewing, J.: Neoplastic Diseases, A Text-book on Tumors. Philadelphia, W. B. Saunders Co., 1919.

Ewing, J.: Chorioma; A Clinical and Pathological Study. Surg., Gynec. & Obst., 1910, **10**, 366.

Ferguson, R. S., et al.: Preliminary Note on New Method of Differentiating the Testicular Tumors by Biological Means. Am. J. Cancer, 1931, **15**, 835.

Kantrowitz, A. R.: Extragenital Chorionepithelioma in a Man. Arch. Path., 1932, **13**, 186.

Newton, R. E.: Glioma of Retina; A Remarkable Family History. Australas. M. Gaz., 1902, **21**, 236.

Slye, M.: Relation of Heredity to Cancer Occurrence as Shown in Strain 621; Studies in Incidence and Inheritability of Spontaneous Tumors in Mice. Am. J. Cancer, 1931, **15**, 2,675.

Susman, W.: Rôle of Pituitary in Etiology of Cancer; Preliminary Paper. Brit. M. J., 1931, **2**, 794.

Zondek, B.: Qualitative and Quantitative Gewebsuntersuchung auf Hypophysenvorderlappenhormon nach Gewebsentgiftung. Zentralbl. f. Gynäk., 1930, **54**, 2,306.

Zondek, B.: Die Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenvorderlappenhormons. Klin. Wchnschr., 1928, **7**, 1,404.

A NEW MEASUREMENT OF OXYGEN ABSORBING POWER*

Edwin E. Ziegler, M.D.

Boise, Idaho

In the performance of routine basal metabolic determinations certain observations were made which led to interesting questions. Why do some people under basal conditions breathe rapidly, 22 to 24 times per minute, while others breathe slowly, from 8 to 10 times per minute? Why do some people breathe very deeply and others very shallowly? Do all people absorb the same amount of oxygen from that which they respire? These and other questions, while not fully answered, led to the work presented in this paper.

It was found that under basal conditions all people do not breathe the same. It is usually considered that the average rate of respiration is 16 to 18 times per minute. However, there are wide variations in the respiratory rate of different people, as can be noticed on basal metabolic charts. It is also observed that there are wide variations in respiratory amplitude. There are those who breathe rapidly and deeply, rapidly and shallowly, slowly and deeply, slowly and shallowly, and with variations of these types. See plates.

From previous physiological experiments it was found that persons absorbed on an average of 4.9 per cent of oxygen from the air which they breathed.

Howell cites work done by Zuntz and Loewy in which analysis of expired air was made. From these analyses the composition of alveolar air was estimated to contain from 11 to 17 per cent of oxygen. Therefore, 3.9 to 9.9 per cent of oxygen is removed from the air by the lungs, according to this work.

Haldane and Priestly, as cited by Howell devised a simple method by means of which the last portions of the air expired were collected and analyzed. This method showed that 7 per cent of the oxygen was absorbed.

These older methods were approximate estimations based on direct chemical analysis of expired air. They included such average figures as the capacity of the bronchial tree, 140 cc., the normal expiration, 500 cc., the alveolar air, 360 cc., etc. These methods while interesting were time consuming, expensive and impractical.

A mathematical evaluation of the respiratory rate, the respiratory amplitude, and the oxygen absorbed, has produced the results set forth in this paper. This work has resulted in a new, simple and practical method of determining the percentage of oxygen absorbed from the total amount of gases respired.

It is not the purpose of this paper to review the subject of basal metabolism. However, an understanding of basal metabolic work is essential to an understanding of the oxygen absorbing power.

Oxygen absorbing power is a measure of the ability of the individual to absorb oxygen from the gases which are respired. It is determined in the same way that basal metabolism is determined in so far as the performance of the test is concerned. It is calculated from the same respiratory graph. The calculation is the feature that is new. The technic of the test is exactly the same as for basal metabolic determinations. The same apparatus is used. It is desirable also when performing the test, to take other interesting data for purposes of correlation.

---

* From the Department of Pathology, U. S. Veterans' Hospital.

Just as for basal metabolic determinations, patients are often ill at ease or apprehensive during their first test. When this is the case, nervous factors will influence the respiratory curve and make it uneven and irregular. It is well, therefore, to ignore the first test or to run a sham test. A second test can be run the first day and preferably on a subsequent day also. Many patients, especially if the test is explained beforehand, will produce a perfectly satisfactory respiratory curve on the first day.

As shown later, oxygen absorbing power will probably be found to be an aid in the selection of personnel in such fields of activity as athletics, aviation, mountain climbing and diving.

CALCULATIONS

The amount of oxygen which one consumes, under basal conditions, is determined from the respiratory graph in exactly the same manner that it is determined for basal metabolic determinations.

The amount of oxygen which one respires is calculated by multiplying the respiratory rate by the respiratory amplitude by the area of the oxygen bell of the basal metabolic apparatus.

The oxygen consumed, divided by the oxygen respired, gives the absorption-respiration ratio or the oxygen absorbing power.

The calculations may at first appear complicated but are in reality very simple. Arithmetical calculations fully meet the needs.

To calculate the oxygen absorbing power the first step is as follows:

Draw a line above the respiration "curve" which represents the average upper limit of respiratory excursions. This is called the upper respiratory line. See plate I.

The line drawn along the bottom of the respiratory "curve" represents the average lower limit of the respiratory excursions. This line has already been drawn to determine the oxygen consumed, and in calculating the basal metabolic rate. It is called the lower respiratory line. See plate I.

The upper line and the lower line thus drawn may or may not be parallel.

The next step is to obtain, by measurement, the mid-point of the respiratory curve, as shown in the plates. Through this mid-point is drawn a vertical line bisecting the two lines already drawn. The part of this vertical line which lies between the above mentioned upper and lower respiratory lines represents the mean respirarory amplitude, abbreviated to MRA.

In some of the plates this vertical line does not appear in the middle of the graph. This is because the graph has been shortened on one side or the other to conserve space and make all of the graphs the same size. However, this vertical line is always drawn through the midpoint of the working respiratory graph.

The number of respirations in each minute of the test is printed on the graphs just below the lower respiratory line.

The average number of respirations per minute must be determined next. Count the number of respirations in each minute of the graph, add them and divide by the number of minutes. The average respiratory rate is abbreviated to ARR.

To obtain the units of oxygen respired, multiply the mean respiratory amplitude by the average respiratory rate. Oxygen respired = MRA × ARR.

The next step is to determine the units of oxygen absorbed per minute. The oxygen absorbed in 6 minutes has already been determined for the basal metabolic calculations. The units of oxygen absorbed in 6 minutes must be divided by 6 to give the oxygen consumed each minute.

The number representing the oxygen consumed each minute is now divided by the oxygen respired each minute and the result is the oxygen absorbing power index. It is also the absorption-respiration ratio. It represents numerically the ability to absorb oxygen from that which is respired. The oxygen absorbing power index (.040) is also expressed as the oxygen absorbing power (4.0 per cent, or per cent of oxygen absorbed).

If the oxygen respired each minute is divided by the oxygen absorbed, the result is a whole number, the respiration-absorption ratio. It is the reciprocal of the oxygen absorbing power index. It represents the amount of oxygen which it is necessary to respire in order to absorb one unit of oxygen.

It was found preferable to use the oxygen absorbing power index and the percentage expression, oxygen absorbing power, in place of the respiration-absorption ratio.

The calculations may be expressed more graphically as follows:

Let oxygen absorbed each minute = O_2A;
Oxygen respired = O_2R;
Average respiratory rate = ARR;
Mean respiratory amplitude = MRA;
Then

$$\frac{O_2A}{ARR \times MRA} = \text{oxygen absorbing power index } (O_2API)$$

As ARR × MRA = O_2R, then

$$\frac{O_2A}{O_2R} = O_2API$$

Calculation of an average case would be as follows:

Oxygen consumed in 6 minutes = 78;
ARR = 10.3; MRA = 24;

$$O_2A = 78/6 = 13$$

$$O_2R = MRA \times ARR = 24 \times 10.3 = 247.$$

$$\frac{O_2A}{O_2R} = \frac{13}{247} = 0.0526 = 0.053$$

Therefore, oxygen absorbing power index is 0.053 and the oxygen absorbing power is 5.3 per cent.

OTHER MATHEMATICAL CONSIDERATIONS

It is not necessary to correct the oxygen quantities in this work to standard conditions of temperature and pressure, as it is for basal metabolic calculations. The reason for this is that the corrections cancel each other. Thus,

$$\frac{\text{P. T. Correction } O_2A}{\text{P. T. Correction } O_2R}$$

becomes

$$\frac{O_2A}{O_2R} = O_2API$$

The oxygen quantities can be represented in units as read from the scale on the B.M.R. chart, because the factors used to convert into cubic centimeters cancel each other. The inside area of the oxygen bell of the basal metabolic apparatus when multiplied by the respiratory amplitude would give the volume of gas respired, and when multiplied by the average respiratory rate would give the volume of gas respired each minute, or O_2R.

Likewise, the inside area of the oxygen bell when multiplied by the oxygen consumed, would give the volume of oxygen consumed, O_2A. Thus

$$\frac{\text{Area} \times O_2A}{\text{Area} \times O_2R} = O_2API$$

becomes

$$\frac{O_2A}{O_2R} = O_2API$$

Likewise, aqueous vapor tension can be ignored.

Various makers of basal metabolic apparatus use charts scaled in different dimensions. This, however, does not affect the calculations. The mean respiratory amplitude (MRA) must be expressed in the same units as the amount of oxygen absorbed (O_2A) and the results will be correct. In this work a new Benedict-Roth recording metabolism apparatus was used.

THE RESPIRATORY GRAPHS

These 5 plates have been included as samples of various types of respiration. The respiratory graph forms the basis for the calculation of the oxygen absorbing power.

The mean respiratory amplitude is indicated on each graph by the vertically placed arrows.

It is always abbreviated to MRA. The respiratory rate for each minute of the test is printed on the charts. The average respiratory rate is shown on each chart. It is always abbreviated to ARR. The oxygen consumed is shown on each chart. The figure indicates the consumption each minute. The oxygen respired each minute is given on each chart. It is the product of the average respiratory rate and the mean respiratory amplitude. The percentage of oxygen absorbed from the gas breathed, the oxygen absorbing power, is printed on each chart.

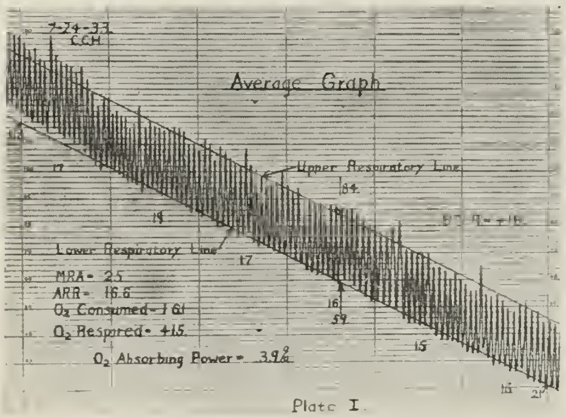


Plate I.

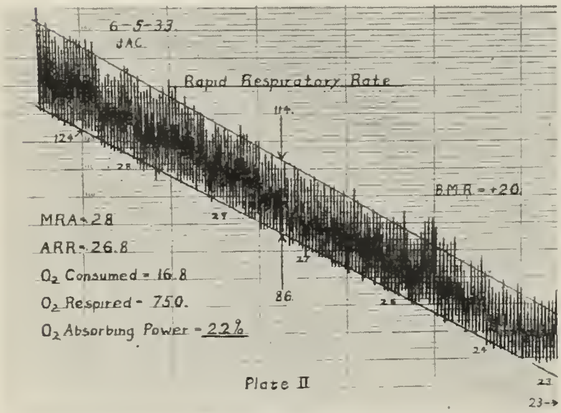


Plate II

The charts were selected without any regard to the basal metabolic rate. It is merely a coincidence that 3 of the charts show a B.M.R. above plus 15.

Plate I shows an average respiratory curve. The oxygen absorbing power is about average, as are the respiratory amplitude and the respiratory rate.

Plate II illustrates a very rapid respiratory rate, a slightly increased respiratory amplitude and a low oxygen absorbing power.

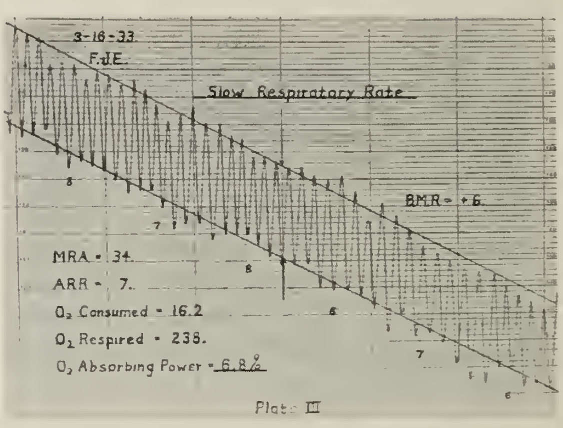


Plate III

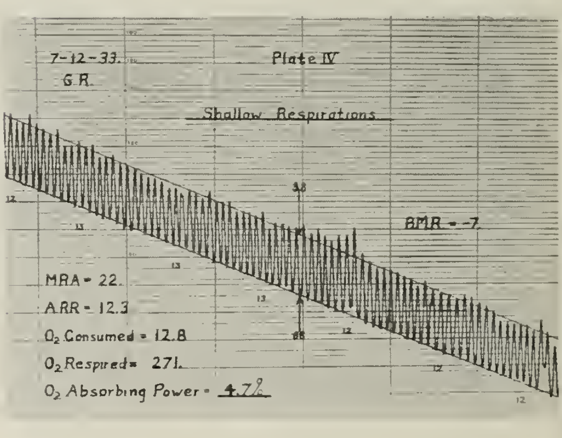


Plate IV

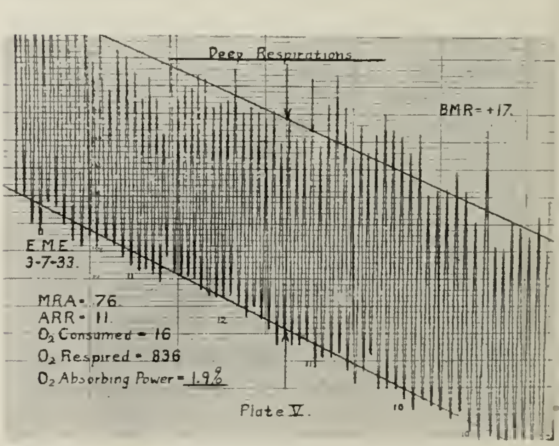


Plate V.

Plate III shows a very slow respiratory rate, a deep respiratory amplitude and a high oxygen absorbing power.

Plate IV illustrates relatively shallow breathing, a relatively slow respiratory rate and an oxygen absorbing power that is about average.

Plate V illustrates an exceedingly deep respiratory amplitude, a relatively slow respiratory rate and a very low oxygen absorbing power.

DATA

The data collected in each case consisted of the name of the patient, the basal metabolic rate, age, height, weight, sex, patient's temperature, temperature of the basal metabolic machine, the barometric pressure, the pulse rate, the blood pressure, disease conditions and occupation. In addition, the erythrocyte count and the percentage of hemoglobin were recorded on each chart. When the patient left the hospital his final diagnoses were copied on the B.M.R. chart for reference in relation to this work.

The class of cases studied so far is somewhat select, since it consists entirely of males. One group lies in the age range of 18 to 30 years, another in the range of 31 to 45 years, with a few cases older. The average age of the first group was 20.9 years, of the older group 40.6 years. There were 54 cases in the first group and 106 in the latter.

The first group consisted of young men from the United States Citizens Conservation Corps. They were brought to Idaho from the metropolitan areas of New York and New Jersey. The majority were admitted to the hospital for the treatment of major and minor emergency surgical conditions.

The older group consisted of veterans of the World War and 2 or 3 of the Spanish American War. They had various major and minor chronic diseases for the most part.

None of the patients in the series was critically or seriously ill at the time of the test. The majority were convalescing from their disabilities.

The results from 160 determinations made so far form the basis of this paper.

RESULTS

The oxygen absorbing power seems to be characteristic of the individual. When this work was begun it was thought that the oxygen absorbing power might vary in the same person from time to time. If this were the case the oxygen absorbing power would have little or no meaning. Repetition of the test on the same individual, days or weeks apart, gave similar results at each test. The same individual had practically the same oxygen absorbing power in each test made, and also practically the same type of respiratory curve. The man who breathed slowly and deeply in one test breathed the same way in subsequent tests. The oxygen absorbing power has been found to be more constant and characteristic of the individual than the basal metabolism.

There were several cases of hyperthyroidism in the series studied. These cases showed changing basal metabolic rates as they responded to treatment, but the oxygen absorbing power remained practically constant, varying only within a narrow range.

Several cases are given briefly to show the remarkable constancy of the oxygen absorbing power from time to time in the same person.

Case 1. (D. A. N.) Test performed on 6–3–33 showed an oxygen absorbing power of 3.3 per cent; on 7–7–33, 3.7 per cent.

Case 2. (M. R. J.) Test on 3–10–33 gave an oxygen absorbing power of 4.3 per cent; on 3–13–33, 4.2 per cent; on 4–19–33, 4.5 per cent.

Case 3. (R. E. C.) Test on 5–1–33 showed an oxygen absorbing power of 3.7 per cent; on 5–8–33, 3.7 per cent.

Case 4. (J. D.) On 3–9–33 the oxygen absorbing power was 5.5 per cent; on 4–17–33 it was 5.8 per cent.

Case 5. (W. S. G.) On 3–1–33 the oxygen absorbing power was 4.6 per cent; on 3–10–33, 4.9 per cent; on 4–20–33, 4.9 per cent.

Case 6. (R. B. P.) On 4–14–33 the oxygen absorbing power was 4.2 per cent; on 5–15–33 it was 4.4. per cent.

The results of this work have been interesting especially from a physiological viewpoint.

No significant number of any particular disease conditions has been studied yet in correlation with the oxygen absorbing power. It would be interesting to make such a study in such diseases as pulmonary tuberculosis, obesity, diabetes, the anemias, cardiac disease, etc.

None of the cases in this work had serious metabolic diseases except 3. Two had hyperthyroidism and 1 had exophthalmic goiter. No significant change in the oxygen absorbing power was noticed with changes in the basal metabolic rate. The average oxygen absorbing power for the total number of cases studied so far is 4.1 per cent. The highest oxygen absorbing power obtained for any patient was 6.8 per cent. The lowest oxygen absorbing power obtained for any patient was 1.9 per cent.

For the age group 18 to 30 the average oxygen absorbing power was 3.9 per cent.

For the age group of 30 and above, the average oxygen absorbing power was 4.1 per cent.

DISCUSSION

It was surprising to find that the average oxygen absorbing power of the age group 18 to 30 was slightly lower than that for the age group above 30. It indicated that there was no general correlation between oxygen absorbing power and age.

No correlation was observed between the oxygen absorbing power and any of the other data collected. This may not be true when the number of cases studied becomes larger.

The oxygen absorbing power appears to be characteristic of the individual and probably depends upon a large number of complex factors such as pulse rate, blood pressure, pulse pressure, erythrocytes, hemoglobin, disease, pH of the blood, carbon dioxide content of the blood, sensitivity of the respiratory center, etc.

Oxygen absorbing power is a numerical expression of a person's ability to absorb oxygen from that breathed. It is the amount of oxygen which can be absorbed for each unit of oxygen respired.

Much work remains to be done before an appraisal can be made of the value of the oxygen absorbing power in clinical medicine. Whether oxygen absorbing power has any significant correlation to disease is not yet known. Thus far it is treated in the light of physiological measurement.

In the field of applied physiology, it appears that the oxygen absorbing power will be of value. The higher the oxygen absorbing power the greater the ability to absorb oxygen from the available supply. The athlete with the highest index would have the best "wind." The diver with the higher index could probably "stay under" longer. The aviator with the higher oxygen absorbing power could probably go to higher altitudes, and the same would be true for the mountain climber.

It is interesting to note that the average oxygen absorbing power obtained in the work was 4.1 per cent. This compares well with the reduction of oxygen in expired air as given by Howell of 4.9 per cent.

	N	O_2	CO_2
Inspired air	79	20.96	0.04
Expired air	79	16.02	4.38
		4.94	4.34

CONCLUSIONS

1. Oxygen absorbing power is a new method of measuring the ratio of oxygen absorbed to that respired. It is a physiological measurement. It represents the individual's ability to absorb oxygen from each unit of gas respired.

2. Oxygen absorbing power should be studied in relation to cardiac, pulmonary, metabolic and other diseases.

3. Oxygen absorbing power would seem to be of practical importance in the examination, study and selection of aviators, athletes, divers and perhaps other special groups of people.

BIBLIOGRAPHY

HOWELL, W. H.: A Text-Book of Physiology for Medical Students and Physicians. Philadelphia, W. B. Saunders Co., 1924, pp. 666, 684 & 685.

THE MODERN CONCEPT OF LYMPHADENOMA*†

ISIDORE LATTMAN, M.D.
Washington, D. C.

A little over a hundred years ago, Hodgkin described a group of cases having a more or less generalized lymphadenopathy. Now there are many different names for so-called Hodgkin's disease, such as lymphadenoma, lymphoblastoma, pseudoleukemia and lymphogranulomatosis.

The etiology of the disease remains unknown. Many hypotheses have been advanced, such as lymph stasis, lymphangitis and infection. Those favoring the theory of infection are divided into two schools, one school believing that the infection is bacterial in nature, the other that a filtrable virus is responsible. The question of the proper place of Hodgkin's disease in nosology is by no means settled.

Our knowledge of Hodgkin's disease has been clarified, or rendered more obscure, depending on the point of view, since Sternberg, a pathologist of note, in 1899 demonstrated the close association of Hodgkin's disease with tuberculosis. In most of his cases Sternberg found the tubercle bacillus in the tissue. Reed also noted this specific histology. Ewing emphasizes the relationship and the similarity of the granulomatous tissue of the two diseases. He states: "In the material gathered in New York where the disease is very common, tuberculosis follows Hodgkin's disease like a shadow. Tuberculous stigmata, tuberculous family history, or tuberculous lesions in the body are the rule in Hodgkin's. Acute miliary tuberculosis often terminates the disease."

From 1899 on, the tubercle bacillus or a filtrate from the tubercle bacillus has never been satisfactorily dissociated from Hodgkin's disease. In fact, a large school grew up which performed sporadic experimental studies. These studies have tended more and more to favor the concept that Hodgkin's disease is a special manifestation of tuberculosis.

Such eminent workers as Vasiliu and Iriminoiu, Bernard, Coste and Lamy, and Coyon and Brun support Sternberg's findings. Martinolli claims it to be a filtrate passing from tubercle bacilli. L'Esperance, in a study of a case of Hodgkin's disease in a child, states that 5 healthy chickens were inoculated intravenously with an emulsion of the lymph nodes, the case being one of typical Hodgkin's disease, both clinically and histologically. All chickens developed tuberculosis, either typical or atypical. Recently a report by the Rose Research, Stonebridge House, Bristol, England, on the modern concept of lymphadenoma was published. I was fortunate in obtaining the book in time for a detailed examination. In the experiments described glands removed from clinically and histologically typical cases of lymphoblastoma were preserved for 2 years by drying. They were then suspended in broth, allowed to macerate in a refrigerator for a week or more, centrifuged at 1200 revolutions per minute, then rendered sterile, and finally injected intracerebrally into rabbits. These rabbits developed the disease characteristic of lymphoblastoma. Controls made with viruses of vaccinia, herpes, psittacosis and other filtrable viruses failed to produce the same symptoms. Also, controls made with glands removed from patients suffering from diseases other than lymphadenoma, including cases of carcinoma, sarcoma, leukemia, granuloma, chronic adenitis and conditions of indeterminate nature, when suspended in broth, allowed to macerate for a week in a refrigerator, rendered sterile, and then injected intracerebrally into rabbits in the same way as in lymphadenoma, have all proved to be inert. From these experiments the author concludes: "from the standpoint of etiology, the point of chief importance that has come to light in course of the present investigation is that the lymphadenoma gland, although giving negative results when examined by current bacteriological methods, contains nevertheless a pathogenic agent possessed of very pronounced and distinctive properties."

---

* Read at the Annual Scientific Assembly of the Society, April 26, 1933.

† From the Radiologic Clinic of Drs. Groover, Christie and Merritt.

The majority of writers, however, still hold that Hodgkin's disease is a true neoplasm. The evidences supporting this position are: (1) the usual absence of tubercle bacilli in sections, (2) negative results of inoculation, and (3) the specific structure of sections. Even Sternberg, who originally described the condition as a peculiar form of tuberculosis, modified his position, and is inclined to admit the existence of a nontuberculous Hodgkin's granuloma. Among the workers who do not believe Hodgkin's disease to be due to tuberculosis are such prominent men as the late Professors Warthin, Karsner, Christian, Hirschfeld, Isaac and Beitzke.

Whatever may be the truth as to the etiology, we must admit that at present we are groping in the dark. We know one thing: that no matter what we do, the prognosis is unfavorable; but we must somehow treat the patients afflicted with this very serious disease.

At the present time X-ray radiation is the best therapeutic agent. There is abundant evidence in the literature to support this contention, not only by radiologists, but by internists and surgeons. X-ray therapy is not curative, but almost all patients respond well to X-ray therapy, and life can be prolonged and made happier. Desjardins of the Mayo Clinic reported a case of Hodgkin's, diagnosed clinically and histologically, who lived 15 years after treatment with X-ray and was perfectly well. McAlpin and Golden report a patient living 13 years after similar treatment.

From the X-ray point of view, if the etiologic agent of Hodgkin's is the tubercle bacillus, cure or at least marked improvement should follow irradiation. For the past 8 or 10 years, tuberculous cervical adenopathy has been treated by irradiation, and is considered the treatment of choice even by most of the leading surgeons in the country; the results of irradiation being far better than those obtained by surgery. If, on the other hand, Hodgkin's is a true neoplasm, it is of lymphoid tissue, and it is, therefore, especially susceptible to irradiation. In his article on "Radiosensitiveness of Cells and Tissues and Some Medical Implications," Desjardins showed by his experimental work that the lymphoid cells are the most radiosensitive of all the cells in the human body. This has been corroborated by many workers throughout the world, Lascasagne in France, Schintz in Germany, and many others. Just as lymphoid cells are the most sensitive to irradiation, so bone and nerve cells are the least sensitive. Although the difference in susceptibility to irradiation between the most and the least sensitive varieties of cells is considerable, none of the cells of the body is invulnerable to irradiation.

The law of Bergoiné and Tribondeau, according to which young and immature cells are more radiosensitive than old or adult cells, has been well recognized and proved by many workers, and has been regarded as the essential foundation of radiotherapy. The law of specific range of sensitivity to irradiation of the different cells in the body is just as important and just as fundamental. The sensitivity peculiar to each kind of cell appears to be related to the life cycle of the cell; that is, the shorter the life cycle of the cell, the greater the sensitivity to irradiation, and vice versa. The life cycle of lymphocytes is the shortest among human cells, and, therefore, they are the most radiosensitive. The nerve and bone cells have the longest life cycle, and, therefore, they are least radiosensitive. This corroborates the law of Bergoiné and Tribondeau. So sensitive are the lymphoid tumors to irradiation that the X-ray therapeutic test, known also as the Ewing test, which consists in subjecting the patient to 1, 2, or 3 small doses of X-ray, is widely used. If the tumor disappears or decreases considerably in size, a definite diagnosis of lymphoblastoma or lymphoid tumor may be made. In the lymphoblastomas we agree with Ewing, that biopsies should not be done unless there is an isolated small gland which can be removed in its entirety. In many cases in which biopsy had been done, metastasis followed very rapidly with fatal termination. To quote Ewing again: "The common practice of immediately excising a cervical node for diagnosis is to be discouraged. A high proportion of diagnoses rendered on this material are inconclusive and misleading. The biopsy does harm in cancer and lymphosarcoma. The therapeutic test by radiation is the better method."

As to the actual treatment of these patients, time will not permit me to go into detail. Suffice it to say that in addition to the regular hygienic and supportive treatment we must treat these patients very slowly over a long period of time. Our group prefers deep therapy; other workers prefer superficial therapy. We have several patients with Hodgkin's, clinically and histologically proven, of 3 to 5 years' standing who feel well and are working every day.

BIBLIOGRAPHY

Bergonié, J., and Tribondeau, L.: Arch. d'électric méd., 1906, **14**, 779.

Bernard, L., Coste, F., and Lamy, M.: Bull. et mém. Soc. méd. d. hôp. de Paris, 1929, **53**, 240.

Coyon, A., and Brun, C.: Bull. et mém. Soc. méd. d. hôp. de Paris, 1929, **53**, 82.

Desjardins, A. U.: Handbook of Physical Therapy. Chicago, A.M.A., 1932.

Ewing, J.: Neoplastic Diseases. Philadelphia, W. B. Saunders Co., 1919.

Hirschfeld, H., and Isaac, A.: Med. Klin., 1907, **3**, 1,581.

Hodgkin, T.: Med. Chir. Tr. Lond., 1832, **17**, 68.

Horder, T., et al.: Rose Research on Lymphadenoma. Bristol, Eng., John Wright & Sons, Ltd., 1932.

Karsner, H. T.: Arch. Int. Med., 1910, **6**, 175.

L'Esperance, E. S.: J. Immunol., 1930, **18**, 127.

L'Esperance, E. S.: Ann. Surg., 1931, **93**, 162.

Martinolli, A.: Arch. di pat. e clin. med., 1929, **8**, 395.

McAlpin, K. R., and Golden, R.: Am. J. Roentgenol., 1933, **29**, 83.

Reed, D. M.: Johns Hopkins Hosp. Rep., 1901–1902, **10**, 133.

Sternberg, C.: Ztschr. f. Heilk., 1898, **19**, 21.

Vasiliu, T., and Iriminoiu, G.: Compt. rend. Soc. de biol., 1926, **94**, 1,311.

Warthin, A. S.: Tr. A. Am. Physicians, 1904, **19**, 421.

Warthin, A. S.: Ann. Surg., 1931, **93**, 153.

THE COMPLICATIONS OF DIABETES MELLITUS*

Maurice Protas, M.D.

Associate in Medicine, George Washington University School of Medicine

The advent of insulin therapy and a better understanding of the treatment of diabetes has permitted the diabetic patient to live longer, and, therefore, to an age when the complications are more numerous. Often diabetes is discovered only after a complication has arisen, and sometimes the latter may progress to a serious extent because of failure to recognize and treat the diabetes which has been so disguised as to give but very little hint of its presence. A knowledge of the complications of diabetes is, therefore, important. It is not within the scope of this paper to go into all the complications of diabetes, but I shall attempt to review briefly some of the important ones.

Complications Affecting the Nervous System

Just what typifies true diabetic neurological lesions is quite questionable, the conditions found being so ill-defined that few observers have expressed their views. In fact, Joslin believes that diabetes does not result in any specific disease of the nervous system, but that the associations are rather through the development of arteriosclerosis. Some of the disturbances described are: (1) Changes in the posterior column, producing clinically either diabetic tabes or peripheral neuritis characterized by lightning pains in the legs, loss of knee jerk and a loss of power in the extensors of the feet, (2) diabetic paraplegia, probably due to neuritis, (3) peripheral neuritis manifesting itself as in non-diabetics by pain, anesthesia, paresthesia, delay of sensibility, motor and trophic disturbances, but limited muscular atrophy.

Senile dementia is far more common than

---

* Read before the Society, May 24, 1933.

insanity, and melancholic depression is not infrequent. Epilepsy in diabetics is far from frequent; it is rather the association of epileptic seizures with hyperinsulinism that is of interest.

OCULAR COMPLICATIONS

In diabetes ocular complications are common, and often the first recognition is made with the use of the ophthalmoscope. Cataracts have been reported in the young and adolescent diabetic, especially by White. The lenses show showers of highly refractile crystals, probably cholesterol. Spalding reported cataracts as the most frequent pathological finding next to retinal arteriosclerosis.

Retinitis is a very frequent finding in elderly patients, occasionally appearing as centralis punctata diabetica, claimed by Hirschberg and others to appear in the pre-diabetic stage.

Retinal arteriosclerosis found in the diabetic is that of hypertensive cardiovascular-renal disease, and the diabetes plays but a minor rôle in its production.

Change in refraction, the patient complaining of blurred vision, is a not infrequent observation, but with regulation of the diabetes a restoration of normal vision usually results.

Lipemia retinalis, reported in but a small series, presents an interesting complication. Wagner claims that with 4 to 5 per cent fat content of the blood the diagnosis of the lipemia becomes possible with the ophthalmoscope; with 8 per cent the changes are outspoken. He states that the changes in appearance of the vessels may be due to the state of aggregation of fat rather than the total lipid content. These patients are thin, but with insulin and proper diet lipemia and the associated retinal picture may clear up in a short time.

DENTAL COMPLICATIONS

The development of the teeth is an interesting problem in the diabetic child and parallels other forms of growth, being in advance of chronological age in diabetes of short duration and delayed after long establishment of the diabetes. The teeth of untreated diabetics are usually poor. In treating dental and gingival disease in diabetics careful control of the diabetes is essential for successful healing.

SKIN COMPLICATIONS

Pruritis pudendi is a very frequent complaint, and one must bear in mind, as Hesseltine has recently showed, that mycotic vulvovaginitis is not infrequent, since this fungus grows in sugar media. Fungicidal therapy is naturally necessary in such cases as well as control of the diabetes.

Epidermophytosis is a very common disease as well as a serious one. These fungi cause the skin to appear mouldy, especially between the toes, and bacterial infection is prone to occur.

Furuncles and carbuncles are common and may be very serious. A bad carbuncle is the most distinctive surgical complication in diabetes, next to gangrene of an extremity.

Fat atrophy of the skin results from repeated insulin injection in rare instances, causing local induration and necrosis of the panniculus adiposus with a depressed area in the integument resulting.

Carotinemia is characterized by a yellow discoloration of the skin, especially marked on the palms, soles and nasolabial folds. The patients usually require insulin, and arteriosclerosis is high in this group. There is a hypercholesterolemia and the prognosis is said to be unfavorable by some men, although a relationship between the excessive carotin and sugar has not been shown.

Xanthoma diabeticorum presents lesions consisting of reddish or orange papules, measuring from 0.5 to 2 cm., found usually over the extensor aspects of the arms, legs and buttock, discretely and usually not in great numbers. With proper treatment these lesions disappear.

ENDOCRINE DISTURBANCES

The thyroid is perhaps of most interest. The incidence of hyperthyroidism in diabetics is about 1.68 per cent, and the incidence of diabetics in patients with hyperthyroidism is about 2.31 per cent. The priority of the appearance of hyperthyroidism over diabetes is striking. The glucose tolerance has been found to be impaired and the renal threshold lowered. Crile reports in a series of 180 cases a lowered renal threshold for sugar in all.

The liver in a case of hyperthyroidism is supposed to be glycogen-poor. It either does not bind glucose or else it lets it go too readily, or there is such an enormous demand for glucose in the body that it is rapidly used and has no chance of being stored in the liver. Crile also believes that the carbohydrate disturbance is due to a diabetic anlage, present in the patient before the hyperthyroidism developed, and that obesity or infection would have brought about the same disturbance. Postoperative examinations to determine the carbohydrate tolerance are very essential, for if the hyperglycemia persists treatment for true diabetes should be instituted.

Disturbance of the pituitary gland may be associated with diabetes. Davidoff and Cushing proved that decreased carbohydrate tolerance accompanies acromegaly, and this explains the high incidence of diabetes in this condition. Pituitary extract has an antagonistic action on insulin, and this brings up the question as to whether the diabetes is a true diabetes or effected through the interference with the normal action of insulin. The chromophilic cells of the pituitary exert a partially controlling influence on the cells of the islands of Langerhans, and, as Joslin points out, these are increased in hyperpituitarism.

Pregnancy is menaced by diabetes more than the diabetes is disturbed by the pregnancy. The clinical significance of sugar in the urine of a pregnant woman and the point when a benign glycosuria will become true diabetes is difficult to ascertain. Glucose early in pregnancy and lactose in the puerperium are usually physiological and not the starting point of diabetes. However, a blood sugar examination, perhaps best taken two or three hours after a heavy carbohydrate meal, is indicated and will often save a very mild diabetes from becoming a serious problem in the course of pregnancy. Pregnancy contracted during diabetes is less frequent than diabetes contracted during pregnancy. A gain in tolerance for carbohydrates and reduction of insulin dosage with a lower blood sugar marks the effect of pregnancy on diabetes. The blood sugar must be used as a guide and not the urine sugar. The question of the fetal pancreas furnishing insulin to the mother is not reported by Joslin, although it has been claimed as a cause of hypoglycemia late in pregnancy and the puerperium.

Abortions and miscarriages are said to be frequent in diabetic patients.

Sterility before the use of insulin was the rule among diabetic women, and with the use of insulin the frequency has been reduced, but there is still evidence of depressed function. Return of menstruation among patients with long standing diabetes comes only after prolonged insulin treatment.

Impotence is said to be common and may be an early symptom, although few textbooks make comment on this subject.

Acute pancreatitis has been reported to percede diabetes in a few cases, but no case of disease of the head of the pancreas has ever been followed by diabetes so far as is known. Pancreatic calculi preceding diabetes are rare.

DYSINSULINISM

There is a condition characterized by periods of hypoglycemia due to hyperinsulinism, in which a typical diabetic curve is obtained with the glucose tolerance test. Adenoma or adenocarcinoma of the pancreatic islet tissue has been found as the cause in some cases. Neoplasms of the adrenal gland, especially of the medulla, may mimic this condition.

HYPOGLYCEMIA

Hypoglycemia is sometimes seen as a terminal condition in untreated diabetics and fails to respond to administration of dextrose.

COMPLICATIONS IN THE CARDIOVASCULAR-RENAL SYSTEM

These now offer some of the greatest complications since the diabetic is living longer and entering the age period for such conditions. The greater incidence of arteriosclerosis in the diabetic and in the younger age groups has long been recognized. Recently diabetes has become regarded as one of the important causes of angina pectoris.

The more rigid control of the metabolic disturbance made possible by the use of insulin has unfortunately resulted in clinical failure rather than improvement in patients with cardiac disease. Insulin apparently increases the irritability of ectopic foci, and with the administration of sugar the extrasystoles which were increased by the use of insulin are reduced in number. Attacks of angina pectoris have been noted with reduction of the blood sugar by the use of insulin, and the attacks have been relieved by the use of dextrose. The electrocardiographic changes after insulin apparently indicate that the heart suffers a depression which affects conduction in particular. The amplitude of the waves is decreased and there is an increased slurring of the QRS complex and the ST segment with a tendency for the T wave to shift in a direction opposite to the major initial complex.

The deleterious action of insulin on the heart is probably not due to a direct toxic action on the myocardium, but is probably related to the reduction of supply of carbohydrate that is readily available to the organ, since the carbohydrate supply to the damaged myocardium is of the greatest importance.

Arteriosclerosis is now the chief enemy of the adult diabetic and has been demonstrated clinically by White in a fairly good series. Juvenile arteriosclerosis as an entity among non-diabetics is rare. White reports 19 of 104 children studied routinely having visible calcification of the vessels of the legs and 5 others having retinal arteriosclerosis alone. To this series White later added 30 more cases of juvenile arteriosclerosis in diabetic children. Hyperlipoidemia occurred prior to the recognition of sclerosis in 75 per cent of the cases. Uncontrolled, decompensated diabetes was the rule in these patients with arteriosclerosis.

Arteriosclerosis of the coronary arteries has been reported in adults under 20 in 3 cases.

Gray and Sansum, who are advocates of the high carbohydrate diets in diabetes, have just reported a 40 per cent death rate as the result of arteriosclerosis in patients with the average age of 63 years. They claim an increasing incidence of arteriosclerosis by decades, and the percentage of patients exhibiting arteriosclerosis whose diabetes was of less than 2 years was practically the same as those whose diabetes was from 6 to 10 years' duration. Sansum also claims a relatively low incidence of arteriosclerosis in his series before the fifth decade, even in cases of long duration, in the patients treated with the high carbohydrate diet. This record may indicate a new phase in the management of the diabetic.

The kidneys are quite important in coma and, of course, changes in the kidney take place with the arteriosclerotic process. Snapper claims an insufficiency of the kidneys in coma characterized by nitrogen retention and inability to oxidize ketone bodies.

INFECTIOUS DISEASES

Tuberculosis as a complication of diabetes is more common in Europe, especially in Vienna, where tuberculosis is still held to be the greatest foe of the diabetic child. It is clinically manifested by insidious onset, afebrile course, no hemoptysis and rapid emaciation. A prolonged cold in a diabetic should warrant study of the lungs.

A decreased sugar tolerance has been found in non-diabetics running a febrile course for weeks and months, and the glucose tolerance was improved with insulin administration. Infections in the presence of diabetes cause a marked lessening of the dextrose tolerance and an enormous amount of insulin may be required to control an acidosis in a diabetic whose usual endogenous supply would be sufficient under ordinary circumstances. Williams and Dick suggest injury to the islets of Langerhans with lessened production of insulin.

Syphilis is a rarity in diabetes, although

Warthin and Wilson differ. The absence of the common sequelae of syphilis, tabes dorsalis, paresis, aortic insufficiency and aneurism, is confirmatory evidence of the infrequency of syphilis as an etiological factor in diabetes. Antiluetic treatment very rarely helps the diabetes when syphilis exists.

GANGRENE

Gangrene forms one of the greatest causes of death in the diabetic. Too much can not be said about preventive measures. Because the feet are not exposed to inspection is no reason to neglect their care. The use of properly fitting shoes, the wearing of clean socks or stockings, avoidance of dyes that are easily absorbable from socks, avoidance of friction from darned socks or stockings, avoidance of tight garters, prompt attention to slight bruises, proper care of corns, calluses and blisters, and daily bathing of the feet are some of the preventive measures.

The clinical signs of lesions due to primary circulatory disease are: (1) Peripheral pulsations absent, (2) toes, foot or leg cold, (3) foot wholly or in part dusky or red and shiny when dependent, blanched on elevation, (4) pain severe and not easily accounted for by the local lesion, (5) osteomyelitis of a phalanx without gangrene rare, (6) local changes of gangrenous nature.

The local lesion should be carefully examined to note whether there is definite demarcation or a diffuse process. If localized cellulitis with pus or osteomyelitis is present in the absence of gangrene usually a fairly satisfactory circulation may be predicted.

Conditions due to primary infections are characterized by: (1) Peripheral pulsation frequently present, (2) foot warm, (3) foot of good color when dependent or elevated, (4) no pain, except as accounted for by local infection, (5) gangrene absent except as result of extension of infection, (6) osteomyelitis of phalanx without gangrene common.

Three types of gangrene are seen in diabetes: (1) Arteriosclerotic, (2) embolic, (3) diabetic. The arteriosclerotic or senile gangrene is due to gradual occulsion of the larger vessels, the occlusion being more rapid than the establishment of collateral circulation. The result is atrophy and mummification of the parts, actual gangrene being precipitated by some minor trauma.

Embolic gangrene is of sudden onset with severe pain and no previous history of disturbance.

Diabetic gangrene presents a history of circulatory disturbance of long duration, during which time an extensive collateral circulation has developed, the patient being nearly symptom-free, although no pulsations can be felt in the dorsalis pedis and at times in the popliteal. Gangrene may follow some minor trauma. There is at first a small area of gangrenous slough or infection, in the latter with swelling and cutting off of blood supply, followed by gangrene which spreads and presents red lines extending along the lymphatics. The gangrene is rarely demarcated and pain rarely occurs. Arteriosclerosis is the background of diabetic gangrene but trauma and infection precipitate the event.

LOCAL INFECTIONS

The lesions primarily due to infection include infected abrasions, burns, paronychia, varicose and other superficial ulcers, osteomyelitis, infected corns and calluses, and the so-called perforating ulcers. Clinically the diabetic differs from the non-diabetic in both local and general reaction. Locally the lesion is more sluggish in appearance, and yet progression is more rapid, there is more destruction of tissue with necrosis in the presence of an apparently good circulation, and insidious involvement of bone occurs with less tenderness. The patient has less pain, lower temperature and slower pulse rate than the non-diabetic.

Perforating ulcers are characterized by non-granulating depressions in preëxisting calluses usually underlying the heads of the second, third and fourth metatarsal bones.

Carbuncles, often the first disturbance calling attention to the presence of diabetes is the second distinctive surgical complication, and is diagnosed by the hard, brawny, tender swelling usually with purplish center and multiple punctate necrotic or discharging areas, as in the non-diabetic. Around the area of induration is a diffuse edematous zone.

DIABETIC COMA

Coma, formerly the greatest cause of death, is now a preventable complication. Its recognition is of utmost importance, especially in the presence of abdominal pain when an acute abdominal catastrophe may be suspected. The presence of nausea and vomiting for periods varying from hours to days, constipation, pain in the abdomen, often cramps, fever of slight degree, rapid pulse, dry tongue, leukocytosis varying from 12,000 to 40,000, the diagnosis may be difficult. But the Kusmaul breathing, dry skin, fruity odor to breath and the soft eyeballs should warrant a blood sugar and CO_2 combining power. The urine may be very misleading. However, one must never forget then an infection may have caused the coma and surgery be really indicated.

Diabetic coma may simulate other diseases, such as the unconsciousness seen in hypoglycemia, the onset of infectious diseases in children under 5 years of age, septicemia, meningitis, encephalitis, uremia, cerebral hemorrhage, brain tumor, epilepsy, narcotic poisoning, concussion of the brain and alkalosis.

BIBLIOGRAPHY

CHASE, L. A.: Diabetic Lipemia Retinalis; Report of Case. J. A. M. A., 1931, **97**, 171.

CRILE, G., ET AL.: Diagnosis and Treatment of Diseases of the Thyroid Gland. Philadelphia, W. B. Saunders Co., 1932, pp. 212, 216.

DAVIDOFF, L. M., AND CUSHING, H.: Studies in Acromegaly; Basal Metabolism. Arch. Int. Med., 1927, **39**, 673.

GRAY, P. A., AND SANSUM, W. D.: The Higher Carbohydrate Diet Method in Diabetes Mellitus. J. A. M. A., 1933, **100**, 1,580.

HESSELTINE, H. C.: Diabetic or Mycotic Vulvovaginitis; Preliminary Report. J. A. M. A., 1933, **100**, 177.

JOSLIN, E. P.: Treatment of Diabetes Mellitus. Philadelphia, Lea & Febiger, 1928, p. 730.

SNAPPER, I.: Niere und Coma diabeticum. Med. Klin., 1927, **23**, 897.

SPALDING, F. M., AND CURTIS, W. S.: Retinitis and Other Changes in Eyes of Diabetics. Boston M. & S. J., 1927, **197**, 165.

WHITE, P.: Diabetes in Childhood and Adolescence. Philadelphia, Lea & Febiger, 1932, pp. 179, 176.

ABSTRACTS OF PAPERS READ BEFORE THE SOCIETY

"EVALUATION OF IRRADIATION IN CARCINOMA OF THE BREAST,"* by **E. A. Merritt, M.D.**

The advent of high voltage roentgen therapy stimulated a more careful survey of the cancer problem and brought the surgeons face to face with the incontrovertible fact that a large majority of cancer patients succumb to the disease regardless of nationality, hospital facilities, or surgical skill. Information is now available relative to the merits of both radiant energy and surgery. The controversy between the exponents of surgery and irradiation has developed a healthy pessimism which supplants the self-satisfied complacency of physicians when cancer is encountered. Surgery and irradiation aim at one objective, viz., the destruction of the growth. If one is successful, the other is superfluous. It is well to remember that when we find a single hard nodule fixed in the tissues of an otherwise normal breast we are dealing with cells in such numbers as to defy all human understanding and comprehension. The figures for a mass 1½ cm. in diameter runs into 8 or 9 billion, and some of these, in 9 out of 10 cases, have reached the axillary, supraclavicular, pleural or mediastinal regions. It is very questionable whether cancer can be completely eliminated when the axilla is involved, even by the most skillfully performed operation. The presence of glands in the axilla is a warning to the surgeon and is substantial evidence that a more serious blight has befallen the patient in the direction of vital organs. Pathologist and experience tell us that cancer of the breast is a much more extensive process than is usually appreciated. The following rules governing the inoperability of cancer of the breast have been formulated at the Cancer Memorial Hospital:

1. All cancers of the breast in women under 40 years of age are inoperable, and their chance for life is definitely lessened by surgical intervention.
2. All cases of the inflammatory type are inoperable, and in this group surgery only adds coal to the fire.
3. Cancers of the breast in women over 65 years of age are inoperable, since surgery does not increase their life-expectancy at that age.
4. All cases with demonstrable glandular involvement

---

* Presented May 17, 1933.

are inoperable, since this precludes complete surgical removal of all the cancer cells.

The Cancer Memorial Hospital group in addition tells us that the results obtained in the small group of these patients comprising the operable class are far better when thorough preoperative high voltage roentgen therapy is administered and an interval of 4 to 6 weeks allowed to intervene before any surgical procedure is undertaken. Postoperative irradiation is always indicated. Portmann of the Cleveland Clinic has collected the statistics from 32 surgical clinics and finds that 80 per cent of carcinomas of the breast are absolutely inoperable. In the presence of these facts it is sheer folly to hold out a promise of cure by surgery alone to women with carcinoma of the breast. Radiation therapy will destroy or inhibit the growth of billions of cancer cells, and when properly employed with combined external and interstitial irradiation in suitable cases offers the one hope left for the majority of these patients.

"CHRONIC PEPTIC ULCERS IN CHILDREN,"* by **Charles S. White, M.D.**

Gastric and duodenal ulcers in children are uncommon, especially the chronic form. The acute ulcer is usually announced by perforation and peritonitis, with a very high mortality. Relatively few cases of chronic peptic ulcers have been diagnosed, treated and followed with an X-ray check-up. Whether the ulcers are more common than the literature indicates is an open question. There seems to be no recognized group of symptoms which are characteristic of chronic ulcer in the child, and whether it is because no such group of symptoms exist or because no systematic study of the subject has been made is not altogether clear. One may look in vain for the etiology. If it exists, the histories in the reported cases have thrown little or no light upon it. The quality or quantity of food does not seem to be of sufficient importance to consider seriously. The symptoms which point to ulcer in children are (1) hematemesis or blood in the stools that is not due to some evident pathology and (2) dyspepsia. Dyspepsia itself in a child needs a careful history and often an X-ray study. The treatment is essentially medical, along the plan suggested by Sippy, unless obstruction or perforation occurs. Such a complication calls for surgical measures. The failure of a case to respond to the medical treatment after faithful and extended trial demands surgery. The operation of choice is a pyloroplasty of the Finney, Mayo or Horsley type. Two cases are reported, 1 in which the patient had suffered with dyspepsia and intestinal hemorrhages for 9 years and had the appendix removed without relief of the dyspepsia. X-ray examination disclosed deformity of the stomach at the pylorus and was thought to be a polyposis. At operation a well-defined chronic duodenal ulcer was found and excised. The second case was in a child, 7 years of age, who had had several tarry stools, and was quite anemic (Hg. 38 per cent). The X-ray diagnosis was "ulcerative lesion at the pylorus." Medical treatment was advised, and although the child improved, the X-ray indicated the lesion was present months later.

"URETHRAL DIVERTICULA IN THE MALE,"* by **R. M. LeComte, M.D.**, and **M. J. Herschman, M.D.**

Diverticula of male urethra are sac-like protrusions or pockets, cavities of which are continuous with the lumen of the urethra itself. They are congenital or acquired. They vary from 2 to 3 mm. in size to that larger than the bladder. They are rare. Four cases were presented in this series, 2 having been operated upon suprapubically, 1 by radio knife intraurethrally and 1 by resectoscope.

Classification

A. In the anterior urethra
  I. Congenital
    1. Primary defect in wall
    2. Primary cyst with rupture
  II. Acquired
    1. From obstruction
      (a) Stricture
      (b) Impacted stone
    2. From inflammation (ruptured abscess)
    3. From injury to wall
      (a) Perforating
      (b) Non-perforating
B. In the posterior urethra
  I. Congenital
    1. Primary defect in wall
    2. Primary cyst with rupture
  II. Acquired
    1. From obstruction (prostatism)
    2. From prostatic calculi
    3. From inflammation
      (a) Rupture of abscess
      (b) Scar tissue contraction
    4. From injury
C. Either in the anterior or posterior urethra
  Rupture of abscess or cyst of Cowper's gland into anterior or posterior urethra.

There is much speculation as to the origin of congenital diverticuli. They may be explained as embryological defects or faculty union of various parts of the urethra.

(Continued on page 244)

---

* Presented at the Annual Scientific Assembly, April 26 1933.

* Presented May 24, 1933.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
Coursen B. Conklin, A.M., M.D., *Managing Editor*
Wallace M. Yater, A.B., M.D., M.S., *Editor*

Committee on Publication
Wallace M. Yater, A.B., M.D., M.S., Chairman
James W. Esler, A.B., M.D.
C. R. L. Halley, A.B., M.D.
F. R. Sanderson, M.S., M.D.
Matthew White Perry, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

OFFICERS 1933–34
President .... Prentiss Willson, M.D.
1st Vice President .... Daniel LeRay Borden, M.D.
2nd Vice President .... Margaret M. Nicholson, M.D.
Secretary-Treasurer .... Coursen B. Conklin, M.D.

LOGIC IN DIAGNOSIS

Diagnosis is not "guesswork." It is logical deduction from facts. Unless the facts are sufficient to permit logical deduction a diagnosis should not be made. Some men have been heard to boast of the value of "hunches" in diagnosis. There may be such a thing as a valuable "hunch," but it must be designated as a "hunch" and not as a diagnosis. One may say, for instance, "this patient looks to me as if he had cancer," but unless a thorough search for cancer reveals it, the physician's impression is only an unproved suspicion. This statement does not mean that imagination is not valuable in the art of medicine, but that the word diagnosis has a definite meaning. Of perhaps greatest importance in many cases in arriving at a diagnosis is the history. In fact, in some conditions the history is all that the diagnosis may be based upon, as in many cases of angina pectoris. Many times, also, the diagnosis may be surmised accurately from the history and confirmed by physical examination; whereas, in other cases laboratory studies are necessary before a diagnosis may be made, if at all. The two divisions in diagnostic procedure are (1) the accumulation of facts and (2) logical deduction. As the patient's history is being elicited certain lines of investigation may be suggested; and during the physical examination other studies may be indicated, but until all of the facts are collected the physician must have an open mind toward the diagnosis, since otherwise he is apt often to overlook or to fail to recognize the real condition because of preformed ideas. After the accumulation of the facts comes the ratiocination. Certain of the facts point to one thing, others to another, but a heavy preponderance toward one disease is necessary before a diagnostic conclusion may be reached. If the facts are not sufficient to allow a diagnosis, then therapeutic tests or observation at intervals is indicated in order that facts may be discovered as they unfold during the course of the disease. Some diseases are easy to diagnose, others are difficult, and in a large number of instances diagnosis is not made until the necropsy has been performed; even then, at times the pathologist fails to help us.

Clinical laboratories exist mainly to aid the clinician in his diagnostic endeavors. It is no credit to a clinician to order a great many unnecessary laboratory tests on the assumption that he is practicing medicine scientifically. The careful but practical physician thoughtfully selects the tests which are indicated, thus saving the patient unnecessary expense. It is very rarely that a shot-gun order for laboratory work is productive of information which would not have been obtained by selective ordering. Certain laboratory procedures may be considered more or less routine, such as the urinalysis, the hemogram and the blood Wassermann or Kahn tests, but the others are special tests and should be ordered with discretion.

A routine method of studying a patient may be monotonous, but it is certainly worth the time spent, since mistakes are less apt to occur and there is satisfaction in the feeling that nothing important has been overlooked. A systematic physical examination should be performed on every new patient with anything but a trivial ailment, and at intervals it should be repeated in order that new developments may be discovered or the progress appraised. To make careful written records consumes time also, but only by making such records may one retain an accurate mental picture of each patient.

ACTIVITIES OF SECTIONS

SECTION ON NERVOUS AND MENTAL DISEASES

Minutes of the Meeting Held March 2, 1933.

The meeting was called to order at 8:15 P.M. by the Chairman, Dr. D. Percy Hickling. Members present included Drs. D. Percy Hickling, D. M. Bullard, C. C. Odom, H. H. Kerr, K. H. Langenstrass, Walter Freeman, J. L. Gilbert, H. D. Shapiro, R. S. Cohen, and about 15 visitors.

Scientific Program

1. "SPONGIOBLASTOMA OF FOURTH VENTRICLE. PRESENTATION OF PATIENT." **H. H. Kerr, M.D.**

Tumors of the fourth ventricle are usually of the medulloblastoma type that yield to X-ray rather than to surgery. The early symptoms consist of paroxysmal vomiting, headaches. unsteadiness, and sometimes cerebellar fits. The earliest symptoms usually pass unrecognized, since no physical signs of cerebellar involvement are present. Choked disks develop when the tumor blocks the iter.

Report of Case: A white girl, 8 years old, had been having paroxysmal headaches for 16 months, and 1 period of 36 hours was spent in coma. An X-ray was suggestive of pituitary tumor, but the visual fields were normal. Finally she developed choked disks, nystagmus and adiadochokinesis, and a midline tumor of the cerebellum was diagnosed. At the first operation, May 20, 1929, the posterior fossa was explored and the cerebellum split, revealing a walnut-sized tumor in the fourth ventricle. The fragment removed for histologic examination showed it to be moderately vascular but of mature cellular type, probably astrocytoma or spongioblastoma. The patient was in poor condition but rallied and was operated on the second time 3 weeks later. The tumor had grown to the size of an egg and was dissected out completely with a good part of the cerebellar lobe; the fourth ventricle was free. A stormy convalescence followed but she returned to school in the fall and is still well, having no complaints and few signs. The patient was demonstrated and a section of the tumor shown.

In closing, Dr. Kerr called attention to the importance of the early recognition of cerebellar tumors, particularly in cases of unexplained vomiting.

In discussion, **Dr. Walter Freeman** suggested that the good result was due to the relatively benign type of tumor, being more of the astrocytoma class, and also to its complete removal.

Dr. J. L. Gilbert asked how long the average case lasted.

Dr. Kerr replied that one patient lived for 2 years but that possibly 10 others had died shortly.

2. "BENIGN CHRONIC HYPOTHYROIDISM; HERTOGHE'S SYNDROME." **Carl Goldenberg, M.D.**

Hypothyroidism of mild degree is of importance to the neuropsychiatrist on account of the frequent nervous symptoms. The presenting symptom is usually constipation, which is quite obdurate and may be associated with nausea, pressure in the epigastrium, hypo-acidity and atony of the stomach; dysmenorrhea and amenorrhea are very common, together with a tendency to adiposity that is due on part to retention of water. There is a tendency to padding of the hips, thighs and shoulders, and occasionally fatty tumors develop, suggesting a relationship to Dercum's disease. Pains in the limbs, muscles and joints are common, with occasional rheumatoid arthritis. The skin is cold, showing sometimes seborrheic eczema, sometimes circumscript edema. The psychic reactions are variable, ranging from depression through neurosis to pure hysteria. Apathy and indifference are common, together with loss of interest, change of mood and development of infantile reactions of spite, fear and animosity. Patients are aware of this emotional change and distressed by it. Intellectual activities are slowed; there is lack of spontaneity, and stereotyped dreams are experienced. Patients worry over their mental state, and particularly over their frigidity. They show great fatigability and incapacity for work. The features are usually coarsened, with loss of fronto-parietal hair and sometimes hirsutism. The heart may beat slowly, and the blood pressure be low. The basal metabolism runs below normal on repeated occasions but not very much below minus 15. The patients tend to have respiratory infections very often and not infrequently develop calculi in the gallbladder or urinary tract. Thyroid medication is specific, and only small doses are required. Dr. Goldenberg reported in brief 3 cases showing this syndrome, all of them relieved by small doses of thyroxin.

Dr. John Minor called attention to the secondary anemia common in this disorder, and also to the fact that patients are by no means always adipose. The blood pressure may be either too high or too low and is often restored to normal by thyroid. The etiology is not infrequently thyroiditis. Frequent checking by basal metabolism is necessary for satisfactory results, and thyroxin has proved superior to other forms of thyroid medication.

Dr. Maurice Protas was impressed by the fact that diabetes can give rise to many of the same symptoms, particularly constipation, amenorrhea, lack of energy, depression and low basal metabolism.

Dr. H. D. Shapiro called attention to the errors in which one might fall from too strict reliance on the basal metabolic rate, finding that in pluriglandular syndromes thyroid might be given with marked relief even though the metabolism rate was above normal.

Dr. Goldenberg closed by stressing the necessity of repeated rate determinations, placing minus 20 per cent as the border line between Hertoghe's syndrome and myxedema. The condition may be imitated by diabetes or other disorders in which the thyroid is unable to compensate.

3. "PSYCHOLOGICAL PLAGUES: A PARABLE." **Walter Freeman, M.D.**

The author described an imaginary conversation between the Master of Evil and his 3 psychological sons, Hurry, Flurry and Worry, previous to their attack upon the Man of the Machine Age.

No discussion.

4. "THE INTERNIST LOOKS AT FUNCTIONAL MEDICINE. NOTES ON THE MONTREAL MEETING OF THE AMERICAN COLLEGE OF PHYSICIANS." **Fred A. J. Geier, M.D.**

Of the 50 papers presented at the meeting, 19 dealt with functional disorders of various types. Gordon stressed the rights of the patient as a person and the beneficial effects of hope as contrasted with fear. Medicine, he said, tended to gradually lean backward instead of downward. The problem of the patient in the clinic was discussed. Stengel showed that a neurosis might overshadow visceral disease and that a recognition of the neurosis was important if best results were to be obtained. Convalescence from pneumonia or typhoid might witness a protracted psychosis and psychoses might accompany many visceral diseases. Coöperation between the internist and psychiatrist was highly necessary. Alvarez found many patients complaining of indigestion to be acutely psychotic. Two important questions were to be asked about the reading habits and the working habits. Operation upon neurotics is to be avoided wherever possible. Hoskins showed that dementia praecox patients filled 20 per cent of hospital beds in this country. He likened the condition to a dreaming mind in a somnolent body. The physical features include polyuria, anemia, leukocytosis, low body weight, slow pulse, low blood pressure, low basal metabolism, low blood cholesterol, and deficient dynamic action of protein. Patients were unstable physiologically. Penfield described the production of convulsions in the conscious patient by stimulating the trigger zone of the cortex. Vascular spasms resulted, blanching of the brain, followed by flushing and marked arterial pulsation, during which the veins grew red as arteries. Post-convulsive paralysis was probably due to ischemia. Excision of the cortical scar often eliminated malignant reflexes.

In discussion, **Dr. Walter Freeman** added two significant contributions, one by Dr. Cone who showed how pressure of the scalene muscle might produce pain, atrophy, paralysis and trophic disturbance in the hand from interference with the brachial plexus or subclavian artery. Dr. George Brown reported a test for prehypertensive individuals by plunging the hand into ice water and noting a phenomenal rise of blood pressure.

Dr. R. S. Cohen stressed the difficulties encountered in the coöperation of internist and psychiatrist, saying that many cases were surveyed and if anything was found the patient would be treated medically or surgically, the neurotic factor being overlooked.

Dr. R. W. Hall noted with encouragement the interest of the internist in the problems of functional medicine, but discounted the work done on dementia praecox.

Dr. J. L. Gilbert said that fears were usually based on concrete experiences but that these experiences were often buried deeply in the unconscious. He was accustomed to ask his patients about any changes of their interest. Many might be damaged by imperfect diet. He was inclined to believe that more than 25 per cent of the hospital beds in the country were devoted to praecoxes.

Dr. D. P. Hickling was gratified at the interest of the internist in functional medicine, stressed the necessity of interesting the students earlier, and said that diagnoses of functional deviation should not be made by exclusion alone. A sick man demands proper study because sickness itself changes his mentality.

The meeting adjourned at 10:40 P.M.

THE GEORGE M. KOBER MEDICAL SOCIETY

The George M. Kober Medical Society held its first autumn meeting at the Washington Golf and Country Club, Monday evening, October 16, 1933.

The program:

"Transverse Presentation." W. Preston Haynes, M.D.

"The Life of Pasteur." Arnold McNitt, M.D.

ATLANTIC DERMATOLOGICAL CONFERENCE

Under the auspices of the Washington-Baltimore Dermatological Society the dermatological Societies of Washington, Baltimore, Philadelphia, New York, New England and Canada will convene in Washington, November 18, 1933, with headquarters at the Mayflower Hotel. Dr. Lee McCarthy is the General Chairman.

Program:

1 P.M.: Luncheon at Georgetown University School of Medicine.

2 P.M.: Dermatological Clinic, Georgetown University School of Medicine.

8 P.M.: Dinner at the Mayflower Hotel. Reservations, accompanied by check for $5 should be made to Dr. Joseph V. Kennedy, 1835 Eye Street, N.W.

Dermatologists of the South attending the Section on Dermatology of the Southern Medical Association at its Richmond meeting, November 14–17, are cordially invited to participate in the activities of this conference.

THE WASHINGTON-BALTIMORE PSYCHOANALYTIC SOCIETY

Course of Lectures

The Training Committee of the Washington-Baltimore Psychoanalytic Society has announced its didactic program for 1933–34. Primarily various lectures and seminars were proposed to be given for the benefit of a few physicians who desired to complete their qualifications for membership in the International Psychoanalytical Association through the local branch society. Registration for the courses already given was double what had been expected. It has been suggested that the courses now being offered may interest physicians other than those engaged, or planning to be engaged, in some phase of psychiatric work. Such physicians are cordially welcome. A nominal fee is charged to defray incidental expenses. Excess receipts will be directed into a fund for more extensive post-graduate facilities desired by the local group.

A series of 10 lectures on "The General Theory of the Neuroses" will be given by Dr. Lewis B. Hill in Baltimore this autumn. During the same period a seminar on "Freud's Three Contributions to the Theory of Sex" will be conducted in Washington by Dr. Ernest E. Hadley. During the winter, Dr. Lucile Dooley will give 10 lectures on "The Special Theory of the Neuroses," in Washington. Next spring 5 lectures on "The Theory of the Instincts" will be given by Dr. Lewis B. Hill in Baltimore. Other courses are projected but these seem to promise something of general interest to the physician.

Address: Dr. Ernest E. Hadley, 1835 Eye Street, N. W., Chairman of the Training Committee, for further information.

SMITH-REED-RUSSELL SOCIETY'S PROGRAM*

The lectures in the Smith-Reed-Russell series at the School of Medicine, George Washington University, have been announced for the first semester of the present academic year, as follows:

Professor W. W. Cort, Johns Hopkins University. October 19th.

Professor James W. Jobling, Columbia University. November 11th.

Professor Howard T. Karsner, Western Reserve University. December.

Dr. Arthur Cramp, American Medical Association. January 11th.

On October 3, Professor George Barger of the University of Edinburgh had as the subject of his address, "Ergot and Ergotism." A large number of students and distinguished guests attended. The afternoon of the same day Professor Barger held a seminar on "Newer Developments Concerning Hormones." The University of Michigan recently conferred on Dr. Barger an honorary degree.

SOUTHERN MEDICAL ASSOCIATION

Richmond, November 14–17, 1933

The Richmond Academy of Medicine Bids You Welcome

With every prospect of a banner meeting, the Southern Medical Association moves on to Richmond for its next annual convention, beginning on the 14th and extending through the 17th of November.

Probably at no time in the history of the nation has solidarity of effort and thorough accord of spirit been more necessary than at this moment when the clouds of the devastating depression seem to be breaking. The physicians of the South, always alert to opportunities and obligations, can "do our part" just now in no more effective way than by bringing to one another the stimulus that flows from the companionship, from the broadening of ideas, from the actual dissemination of new thought that always mark the sessions of this great organization.

It seems fitting that this girding of the medical forces of the South for the New Day that is dawning should occur in the capital of the Old Dominion, the focal point of so many stirring events in the history of the United States. Today a metropolitan area of wide dimensions and a medical center of real note, Richmond, of a yesterday that reaches back to the dawn of English occupancy of this continent, is filled with memorials of great names and greater deeds that, along with its natural beauties, lend it a lure, a charm equalled by few other American cities. To these physical and historic embellishments it adds a warmth of hospitality that assures a genuine and winning welcome to our Association.

---

* Undergraduate Honor Society.

In behalf of the profession in this city as expressed by your host, the Richmond Academy of Medicine, we extend to the physicians of the South cordial greetings and expression of our earnest desire to have you with us during these notable sessions. General and sectional programs have been admirably arranged and the clinics and scientific exhibits will offer demonstrations of lively interest. Local committees will spare no effort to contribute to the comfort and convenience of the delegates and such guests as may accompany them. The social diversions offered by the city will be very engaging and the points of interests here and in the surrounding territory will lead you into many delightful byways. Let us hope, then, to see you among this great host. It will be our pleasure to solve your problems of transportation, of hotel reservations, or of anything else that may be bothering you. If you have established no other contacts, the undersigned will be very gratified indeed to receive your communication and direct it into the proper channel for immediate action.

Joseph F. Geisinger, M.D.
Chairman, Publicity Committee
Address: Stuart Circle Hospital, Richmond, Va.

Let's go! Ed.

COST OF MEDICAL EDUCATION

In contrast with tuition fees which now approximate $500 per annum with a curriculum covering some 7 years, we find the following schedule as abstracted from a catalogue, 1890–91, of a well-rated local medical school:

"Matriculation (payable but once)	$5.00
First Class	60.00
Second Class	105.00
Third Class	60.00
Demonstrator's ticket, each year	10.00
Each Laboratory ticket, each year	5.00

No graduation fee is required. Payment of fees is required at the commencement of the session. Good board can be obtained in the immediate vicinity of the College at from $20 to $30 per month."

ABSTRACTS OF PAPERS READ BEFORE THE SOCIETY

(*Continued from page 239*)

Acquired types are due to obstructions such as stricture, urethral calculi or valves. Calculi may have formed in pockets secondarily. Trauma is a cause. Congenital diverticuli in the posterior urethra have been held due to defects seen in fetuses 3 months old.

Acquired types have been explained on the grounds of ruptured abscess or contractures from scar tissue towards periurethral areas. Operative and gunshot wounds are factors. Valves play a part. Abscess or cyst of Cowper's gland either congenital or acquired may rupture and communicate with the anterior or posterior urethra. Infection often supervenes in these pockets. Pathologically, in the uninfected congenital type, the picture is an epithelial lining lying on a basement membrane supported in turn by a tunica propria. Infection may destroy these when its picture is like that of the acquired type, namely a scar tissue bed with or without an epithelial lining. Calculi have been reported by Grube, Lowsley, Neugebauer, Howze, Hennessey and Bourdillat. When in the anterior urethra there appears a pyriform, soft collapsible swelling in the course of the urethra during urination. If obstruction be present, urine will dribble afterwards for as long as half an hour, or urine may be retained in the diverticulum, due to valve formation. A stubborn urethritis may be the only sign. Calculi may be present. The posterior type may present a persistent posterior urethritis or cystitis. Some patients show sexual symptoms ranging from impotence to half erections. Ejaculation may be prolonged. "Terminal incontinence" is the outstanding symptom. Instrumental examination clears the diagnosis. During a routine examination such a pocket may be accidentally found. Opaque catheters doubled in these recesses and X-ray study after injection of opaque solutions will further confirm this impression. Palliative treatment is usually unsatisfactory. Operation is indicated. Those in anterior urethra if small, may be destroyed by the radio knife. If large, they must be dissected out and an end-to-end anastomosis of the urethra done, being careful not to sacrifice more than 4 to 5 cm. of urethra, for sexual reasons. Small ones in posterior urethra may be obliterated by endoscopic excision or incision. Larger ones may be attacked by the resectoscope, if practical, or by the suprapubic route. In either case the internal sphincter is cut and 1 large cavity of bladder and posterior urethra made. The external sphincter muscle then entirely controls urination.

Discussion by **Dr. C. P. Howze.**

REPRINTS RECEIVED

The following reprints have recently been received for which due acknowledgment is made:

"Psychiatric Aspects of Occupational Therapy," Occupational Therapy and Rehabilitation, June, 1933, by Dexter M. Bullard, M.D.

"Report of a Case of Ruptured Ovarian Cyst in the Newborn," American Journal of Obstetrics and Gynecology, June, 1933, by Samuel M. Dodek, M.D.

"The Trial of Guiteau," American Journal of Psychiatry, July, 1933, by Frederick A. Fenning.

"Spontaneous Rupture of the Sigmoid Portion of the Lateral Sinus," The Laryngoscope, January, 1933, by James A. Flynn, M.D.

"Atelectasis Following Aspiration of Pecans," Archives of Otolaryngology, February, 1932, by James A. Flynn, M.D.

"Grain Itch—Report of Two Cases Occurring in a Small Epidemic," Virginia Medical Monthly, September, 1933.

"Primary Hemangio-Endothelio-Sarcoma of the Liver," Journal of the American Medical Association, July 8, 1933, by Charles S. White, M.D.

COLLECTED REPRINTS FROM THE WILMER OPHTHALMOLOGICAL INSTITUTE

VOLUME III

January, 1932 to June, 1933

Sixty-five papers are collated covering this period with notation that 11 papers published in the literature do not appear. A tribute to an honored member of the Medical Society of the District of Columbia appears as follows:

"On the occasion of his seventieth birthday the members of the staff of the Wilmer Institute who have contributed to this volume desire to express to Doctor William Holland Wilmer a tribute of their affection."

MEDICAL MEETINGS*

OCTOBER AND NOVEMBER

October 20: Section on Ophthalmology and Oto-Laryngology.

1. Report of the proceedings of the recent meeting of the American Academy of Ophthalmology and Oto-Laryngology at Boston:
   (a) Ophthalmology. Wm. Thornwall Davis, M.D.
   (b) Oto-Laryngology. G. Bache Gill, M.D.
2. "Congenital Stenosis of the Larynx. Case Report." R. W. Wilkinson, M.D.

October 24, 25, 26: Medical Society of Virginia, 64th Annual Session, Lynchburg, Va. J. Carroll Flippin, M.D., President; R. D. Bates, M.D., President-elect.

November 20: The George M. Kober Medical Society, at the Washington Golf and Country Club.

1. "Hydronephrosis and Hydroureter. Case Report." Hugo Einstein, M.D.
2. "The Psychiatric Aspects of Essential Hypertension." Lewis B. Hill, M.D.

THE SECOND DAVIDSON LECTURE

On the evening of October 11, 1933, with President Prentiss Willson presiding and about 250 members with guests present, Dr. E. A. Merritt read his address, "X-ray Treatment of Bone Conditions Produced by Hyperparathyroidism."

In introducing the speaker, the President took occasion to laud the good work of Dr. E. Y. Davidson. He stated that the lecture foundation was established "to perpetuate the name and memory of Dr. Davidson. This was done because of the incalculable services he rendered the Society in suggesting, directing and co-ordinating our efforts to own our own corporate home. The occasion is significant; the event will be historical. It is a rather solemn and intriguing thought that when every one present here this evening, when every present member of the Society, even, is but a memory in this auditorium, it will still be occupied by generations of physicians, as yet unborn, brought together here for the same purpose that calls us together tonight." The establishment of the biennial lectures "not only serves to perpetuate his name, as would have a memorial of bronze or stone, but also serves the greater purposes of post-graduate medical education."

Dr. Merritt's paper which outlined much pioneer effort in establishing effective therapeusis for bone disease that heretofore proved most resistant to treatment, will, it is hoped, appear in the pages of a later number of your Society's publication.

---

* To Section Secretaries and Officers of Smaller Societies: Send in your programs at the earliest possible time to 1718 M Street, N. W., for appearance in this column.

A pleasing conclusion to the evening was a buffet supper served in the Society's Library.

COMMITTEE ON MEDICAL ECONOMICS

The Committee on the Costs of Medical Care is now the Committee on Medical Economics. A thorough discussion of the subject of the physician in relation to present changes in medical practice was entered upon at a recent meeting of the Society. The Executive Committee in its report showed that the field of activity of this committee's work was much broader, taking in investigation of dispensary abuse and contract practice. Dr. Joseph Horgan's motion, bringing about the change of name and enlarging the scope of the committee's work, was adopted. Dr. Thomas A. Groover stated that his committee was going to invite Dr. Seth A. Brumm, President-elect of the Philadelphia County Medical Society, to give details of the "Philadelphia Plan." Much applause greeted this announcement. In concluding, Dr. Groover expressed the opinion that the profession, especially members of hospital staffs, should blame themselves for any encroachments that dispensaries were making on incomes from practice.

FACULTY SEMINAR

George Washington University School of Medicine

On October 11, 1933, at the Cosmos Club, Professor Earl B. McKinley of the Department of Bacteriology and Dean of the School, spoke on the subject, "Etiology of Encephalitis with Particular Reference to Experimental Work on the Recent St. Louis Epidemic." Members of the faculty and guests meet monthly at luncheon with a speaker on an appropriate topic for discussion. Dr. Vincent Du Vigneaud is Chairman of the Committee on Faculty Seminars.

BOOK NOTICES

American Medical Directory, 13th Edition, 1934.

One of the most frequently consulted books in your Society's office is the Directory of the American Medical Association. Telephone calls from physicians are frequent. "What is the address of Doctor Smith in Philadelphia? I have forgotten his initials but I know he is a laryngologist, graduate of University of Pennsylvania, about 60 years old." Often it is possible to supply the information. A personal history card from the American Medical Association headquarters has recently reached you. Be sure to supply desired data and promptly mail. Insurance and other appointments frequently depend on membership in local component Society. Do not allow your name to appear in the coming volume without the A. M. A. insignia. Pay your *dues* before December. Cost per copy, 13th Edition, 1934, $15.00. Your office will need this book.

The Text-Book of Neuropathology, by Arthur Weil, M.D., Associate Professor of Neuropathology, Northwestern University Medical School, Chicago, Illinois. Philadelphia: Lea & Febiger, 1933. 335 pp., illustrated with 260 engravings. Price $5.00.

In this book there has been amassed information succinctly presented which should yield to the reader a better understanding of the reaction of structures making up the central nervous system in disease. The clinician, as well as the neurologist may well profit in perusing the realiable collection of data presented. There are 260 engravings both of gross pathology and microscopic. In a final chapter there are described modern methods in preparation of specimens for ordinary microscopic review as well as slides for use in the stereopticon. A bibliography, not too extensive but definitely of advantage to the student in gaining knowledge of basic investigations in neuropathology, is of special value.

CONTAGIOUS DISEASE REPORT, AUGUST, 1933

Health Department, District of Columbia

	Morbidity	*Mortality*		*Morbidity*	*Mortality*
Typhoid fever	7	2	Encephalitis-Lethargica	0	0
Typhus fever	0	0	Epidemic Cerebrospinal Meningitis	1	0
Smallpox	0	0	Tuberculosis (all forms)	91	46
Measles	19	0	Syphilis	540	5
Scarlet fever	20	0	Gonorrhea	324	0
Whooping cough	44	1	Chickenpox	6	0
Diphtheria	29	0	Chancroid	6	0
Influenza	1	1	Pellagra	1	1
Poliomyelitis	1	0	Pneumonia (all forms)	59	16

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA

VOLUME II NOVEMBER, 1933 NUMBER 11

HYPERPARATHYROIDISM*

EDWIN A. MERRITT, M.D.
Washington, D. C.

The amazing, complex and obscure mechanism which controls calcium metabolism is centered in the parathyroid glands. To what extent they are inhibited or stimulated by the influence of certain vitamins and other hormones will doubtless soon be determined now that interest is directed with increased intensity toward the endocrine system. Meanwhile as the quest for certainty is pursued, we may draw provisional conclusions from clinical observations, which although as yet in some respects are incomplete and without absolutely satisfying accuracy, may prove to be foundation stones on which a permanent structure can be erected.

My interest in hyperparathyroidism was aroused in May, 1931, by the coincidental healing of an extensive and multiple cystic bone lesion in a patient being irradiated over the cervical region for thyrotoxicosis (Merritt). The rapid relief of pain and the uninterrupted and progressive regeneration of the diseased bone in this case resulted in a review of the literature covering the subject, much of which has been abstracted and is presented herewith. It is quite likely that similar results have been effected by others, when we consider the thousands of subjects who have been irradiated for one reason or another over the cervical region, but no instance of such a cure has been recorded. It is sound reasoning, also, to assume that there are exceptions to the ancient adage, "there is nothing new under the sun," for the roentgen ray was introduced into this world for the first time in 1895, and phenomena resulting from its use are, therefore, no older.

The association of the parathyroids and osteomalacic conditions covers a period of about 30 years, and another decade before that Gley, Vassale, and Generali had established the distinction in function between the thyroid and parathyroids.

In 1891, von Recklinghausen first described osteitis fibrosa cystica, the osseous disease which now bears his name, and De Costa in 1909 contributed 8 cases of parathyroid tumors to the literature, 1 of them being his own. Neither of these men apparently recognized any connection between the parathyroids and the skeletal disease resulting from the hypersecretion of these glands. In 1903, Erdheim saw the two conditions associated three times and made the first attempt to connect them etiologically, claiming that parathyroid hyperplasia was due to the effort of the glands to increase calcemia. More recent investigations tend to show that parathyroid hyperplasia is a physiologic response to altered phosphorus and calcium metabolism.

In 1904, Askanazy published the first case of parathyroid tumor found postmortem in a subject with fibrocystic disease. By 1925 Hoffheinz had collected 25 cases of parathyroid tumors, 27 of them being complicated by osteopathies. In the same year Mandl, an Austrian surgeon, achieved distinction by performing the first parathyroidectomy for the successful cure of an osteomalacic condition. Mandl was not certain at first whether the disease, osteitis fibrosa cystica, was the result of hyper- or hypoparathyroid activity, but he established definite proof by transplanting the glands into an individual who had the disease, producing thereby an aggravation of symptoms and an increase in the skeletal findings, whereupon he removed the parathyroids and cured the osseous disease.

---

* Second Davidson Lecture, read before the Society, October 11, 1932.

Thyrotoxicosis and myxedema are antithetic conditions in the pathology of the thyroid. So in the parathyroids we have two opposing diseases, namely, tetany and hyperparathyroidism (Ballin and Morse). Tetany may result from parathyroid disease, but more often it is produced by injury to, or the accidental removal of the glands during goiter operations. Complete extirpation of the glands results in tetany and death unless reparative therapy is promptly instituted. This consists of the administration of calcium in some readily assimilable form, or, far better, the use of potent extracts of the parathyroids, isolated by Hansen and Collip independently, and known as parathormone.

In tetany the bones are not affected, while in hyperparathyroidism there is a local or general demineralization, and the bones are consequently fragile. In tetany irritability of the nerves and muscles is greatly increased, while in hyperparathyroidism there is a condition of relaxation and the threshold of stimulation is raised.

The blood calcium in tetany is usually low, averaging 4 to 6 mg. per 100 cc. of blood; in hyperparathyroidism the blood calcium is usually high, averaging 11 to 20 per 100 cc. However, Bloom reports a cure of cystic bone disease following parathyroidectomy when the blood calcium was but 5 mg. per 100 cc. The serum inorganic phosphorus is generally decreased in hyperparathyroidism and increased in tetany, although there are authentic cases in which no variation in either has occurred.

The relief or cure of tetany depends upon feeding calcium and administration of parathormone as above stated, while in hyperparathyroidism the inhibition, destruction, or removal of the glands is indicated.

Experimentally the administration of parathormone has produced demineralization of bone, and its prolonged administration has produced cystic bone disease. Animal experiments reported by Jaffe and Bodansky in 1930 show that the production of osteitis fibrosa cystica by the administration of parathormone is possible in dogs, but much more difficult than in guinea pigs. The difficulty lies in the fact that in the dog, doses of parathyroid extract (parathormone Collip) necessary to produce marked resorption of the bone and marrow injury, are liable to lead to fatal hypercalcemia before there is much fibrous repair. They studied 11 growing puppies for periods of from 10 to 180 days, which were under the influence of increasing doses of parathormone. They produced, depending upon the dosage and length of time under parathormone, all degrees of change from mild bone resorption and slight fibrous replacement of the marrow to severe bone resorption and degeneration of the marrow with hemorrhage, when the animals died from overdosage. Finally, they produced typical osteitis fibrosa cystica in 3 dogs that were injected for 5 to 6 months. In these they gradually increased the daily dose of parathormone. At the end of the experimental period they were receiving 20 units daily. One of the most marked clinical features in all the dogs was the stunting of their growth, which was referable to a cessation of bone formation and growth at the epiphyseal cartilage plates. During the study frequent blood examinations were made, particularly of the serum calcium and phosphorus, but they found that loss of appetite was a very good indication of the existence of hypercalcemia and parathormone overdosage.

It takes several months to produce fibrous changes in the bones of dogs. These fibrous changes may be produced even when calcium intake is high. The production of osteitis fibrosa was enhanced in the dogs by depleting their calcium stores through the diminution of the calcium intake, which permits giving large doses of parathormone without danger of hypercalcemia. That the changes observed could not be attributed to calcium deficiency alone is evident from examinations of bones of control dogs kept for months on low calcium diet. These animals developed osteoporosis, which is quite different from osteitis fibrosa cystica.

These and other experiments, together with a large number of clinical studies, have established the fact that osteitis fibrosa cystica is caused by hyperparathyroidism. The disease is a definite clinical entity possessing, when thoroughly established, well-defined symptoms and characteristic roentgen findings. It is said to occur most frequently in females between the age of 30 and 60 years. The cardinal symptoms are those of most constitutional diseases, although pain and muscular weakness dominate the clinical picture. There is usually an accompanying secondary anemia and occasionally an elevation of temperature.

Renal colic and renal calculi may be associated with the bone changes, and Hunter of England has noted the disappearance following parathyroidectomy of urinary calculi too large to be expelled spontaneously.

A general, associated endocrine imbalance, especially noted in changes in the thyroid gland, is the rule in advanced cases.

The roentgen findings in a typical case of osteitis fibrosa cystica are usually sufficiently convincing to establish a diagnosis (Camp and Ochsner). The predominating change is a decalcification associated with multiple cystic areas and a uniform granular mottling, especially of the skull. The sites of predilection for the cystic areas are the points of most active bone growth; that is, the metaphyses of the long tubular bones. The vertebral bodies are flattened and often show compression fractures, and sometimes the vertebral bodies appear to have exploded. Pathological fractures of the ribs, vertebrae and long bones, in the absence of malignancy, would justify a provisional diagnosis of hyperparathyroidism in any case. Indeed, any unexplained cystic bone disease should be considered of parathyroid origin, in the opinion of my associates and me, and the therapeutic test of irradiation over the cervical region should be used as a confirmatory diagnostic procedure.

Pain in this disease is not easily explained unless it is local and results from a pathological fracture, but in general it is most likely due to hypercalcemia, and this idea is supported by the very prompt relief which follows irradiation or a successful parathyroidectomy.

A typical case presents no diagnostic difficulties if a routine roentgen examination is made, but there are a great many cases in which accuracy in diagnosis is impossible. A single bone cyst accidentally found, or a fracture at the site of a cyst may represent the beginning of the disease; it may be a local or metastatic malignant lesion and not infrequently a giant cell cyst, a granuloma, or a bone abscess. Similarly a local or general demineralization may be the precursor of multiple cystic lesions, osteoporosis from constitutional disease or disuse, or any one of several other conditions.

It is my personal belief that an accurate diagnosis is the exception rather than the rule when all of the variants are compared with the well-defined cases.

A new chapter in endocrinology is being written. We stand now at the threshold of an era which begins with the established fact that calcium metabolism is governed by parathyroid function and by vitamin D. The parathyroids probably perform the necessary function of maintaining a normal level of serum calcium and phosphorus in the blood, but this level cannot be maintained by parathyroid secretion alone. Vitamin D is also essential for normal calcium metabolism, and this vitamin may be and probably is as essential to normal parathyroid function as the iodine content of thyroxin is to normal thyroid function.

Investigators at the University of Wisconsin (Kozelka, Hart and Bohstedt) maintain that parathyroidectomized dogs develop normally and can survive a complete reproductive cycle if provided with adequate feedings of viosterol. However, this statement must be accepted with reservations, for the surgical removal of some of the parathyroids is one thing and the removal of all of them another and far more difficult of accomplishment, as will be shown later. In this connection it may be mentioned that thyroid tissue and cells closely resembling parathyroids have been found in the pelvis, which justifies the inference that parathyroid tissue may also be elsewhere than in the cervical region (Masson and Mueller).

Bromer and White of the Bryn Mawr Hospital believe they have established experimental proof that irradiation depresses the parathyroid function. They maintain also that they have been able in at least one case to increase calcium deposition in cystic areas by the administration of calcium and phosphorus in the ratio of 1 to 2. They claim to have produced both osteitis fibrosa cystica and osteitis deformans by regulating calcium and vitamin D in monkeys. They summarize by stating that parathyroid hyperplasia and even possibly true adenomas are, in their opinion, a secondary result of dietary imbalance over a long continued period. Paget's disease, they believe, is due to hypoparathyroidism, but they admit in this respect that their material is too limited to furnish a basis for substantial proof.

In the comparatively small group of cases studied by my associates and me the conclusion is inescapable that there is bound to be a reclassification of cystic bone lesions which have heretofore been histologically regarded as separate and distinct entities.

The evidence which establishes hyperparathyroidism as a cause of osteitis fibrosa cystica is, as I have said, conclusive, but it is interesting to speculate on the possible relationship which exists between hyperparathyroid function and other osteopathies. The late Dr. Oppel of Leningrad, who has performed more parathyroidectomies than any other surgeon, maintained, as do Ballin and Morse of Detroit, that in ankylosing polyarthritis the initial focal infection is the nidus for the deposition of lime in patients predisposed to metastatic calcification by parathyroid dysfunction. These investigators believe that Perthes', Köhler's, Osgood's, and Kienböch's diseases are of parathyroid origin, and I am presenting an arrested case of what appears to have been Perthes' disease, following irradiation of the parathyroids.

There are always at least two avenues of approach in the management of a medical problem. In considering bone cysts and bone lesions in general we may follow the usual procedure recommended by surgical pathologists and resort to surgical attack of the lesion, depending on a histological study for a diagnosis. Had this course been pursued in the patient presented this evening, as the first reported cure of cystic bone disease by irradiation of the cervical region, this paper would not have been written.

Bone cysts, either single or multiple, and bone diseases as a whole are not of a malignant nature. Their cure does not demand early or radical surgical intervention. Unquestionably more limbs have been amputated and lives sacrificed by ill-advised surgical measures than have been saved by well directed surgical operations.

A reasonable delay while a roentgen ray study of the whole skeleton and appropriate blood investigations are being made in most cases of chronic osteopathies will yield better end-results. The approach to osteopathies in the light of recent events is biological and biochemical rather than surgical and histological.

I have no means of knowing what conclusions might have been drawn had the distal third of the femur been amputated or curetted in the case above referred to. A pathologist might have been justified in reporting a giant cell tumor or any other opinion ranging from cellular débris to borderline or actual malignancy. Even in the light of subsequent events and our augmented knowledge of the subject, we have no reason to believe that a surgical dissection or a microscopic study of the specimen would have given any clue to the cause of the cyst. The etiology of parathyroid dysfunction is still somewhat obscure, yet we have positive evidence that an abnormally active parathyroid will provoke a characteristic chain of symptoms and physical findings chiefly related to the osseous system and in some instances closely related to conditions heretofore regarded as malignant.

The parathyroids are not alone in their ability to produce lesions which either are, or closely counterfeit malignant growths. The anterior lobe of the pituitary is responsible for quite startling and distinctive bone conditions, and the unpublished work of Ferguson of the Memorial Hospital connects the middle lobe with the highly malignant melanomas. Such tumors being of neurogenic origin are exceptionally resistant to radiation, a well known characteristic of nerve tissue. The growth of rat carcinoma is materially retarded in hypophysectomized animals, and cancer transplants in rats are always more difficult and frequently impossible when the hypophysis has been removed (Samuels, Ball and Simpson).

Metastatic tumors of thyroid origin, according to the radiologist Ginsberg, who has made an exhaustive study of the subject, show a decided tendency to increase in size and present more subjective and objective symptoms when the patient is menstruating. The favorable influence of an artificially induced menopause on malignant tumors, especially of the breast, has been noted by many observers, and there is probably something more than mere coincidence in the fact that malignancy in general begins in the life cycle of individuals when changes in the endocrine system are manifest.

There is no conclusive experimental evidence to support the theory that either parathormone or vitamin D are directly connected in the etiology of malignancy, yet we know that hyperparathyroidism and malignancy have several things in common, among which are age, pain, asthenia, anorexia, loss of weight, loss of muscle power, elevation of temperature, secondary anemia, and bone destruction. These constant findings strongly suggest a common denominator. Teratoma testis, cancers of the adrenals and cancers of ovarian origin are other examples of endocrinologic malignancy.

The normal balance of a hormone in any of the endocrine group is adjusted to a scale absolutely incomprehensible to those of us accustomed to the weights and measure of the apothecary. For that matter, even in every single living cell the respiratory ferment which is indispensable for cell growth contains minute traces of so-called enzyme iron which can be demonstrated only by the most delicate qualitative reaction. Nevertheless the life of the cell is destroyed if the iron is removed or its action chemically prevented.

These substances are, in fact, designated by a new word; it is gamma. One grain is 6,400 gammas, and in the case of the thyroid the average man requires 35 to 70 gammas of iodine daily if a depletion of the normal iodine content of the thyroid is to be avoided. He would, therefore, require in 3 years about 1 grain of iodine.

A few illustrations relative to the action of hormones may be given. If the organic compound thyroxin containing iodine is deficient in the thyroid, severe metabolic disease is induced; in the lower animals an hereditary lack of the compound produces extraordinary effects. An American species of salamander, the Axalotl, found in our western lakes and weighing about a pound, often fails to complete its metamorphosis especially in captivity, from the aquatic, gill-breathing fish to the fully developed terrestial lung-breathing animal. A single abdominal injection of a hundred thousandth of a grain suffices to produce promptly and positively the otherwise suspended metamorphosis (Hahn). A tadpole that develops very slowly, if at all, in water wholly freed of iodine accomplishes its metamorphosis in a thyroxin solution of one part thyroxin to 5-thousand million parts of water, and more rapidly than it would in an otherwise normal environment. There is a growth-producing substance for plants called, Auxin, 2 mg. of which is excreted in the human urine every 24 hours. A fifty-millionth mg. of this constitutes a growth unit and exerts unbelievable effects on plant life. In the inorganic world we have boric acid, which is absolutely essential to the ripening of the pollen of tropical water lilies. Development ceases in its absence and proceeds in its presence, when but a hundred thousandth to a millionth part is added. These figures and statements are not taken from the pages of a Hahnemann text, but on the contrary they are established scientific facts.

Sir Frederick Gowland Hopkins in a recent address entitled, "Some Chemical Aspects of Life" says, in brief that "Vitamin D, whose presence in the blood stream can only be expressed in astronomical figures, controls the growth of bone in particular. The unit elements in its structure are Isoprene Radicles. An Isoprene is a non-saturated hydrocarbon, but instead of forming long chains as in Vitamin A, unites into a system of condensed rings. Similar rings form the basal constituents of the molecules of sterols. Sterols are constituents of nearly every living cell; it is one of these, inactive itself, which the ultraviolet ray converts into Vitamin D."

Very important researches have recently shown that particular constituents in tar alone cause cancer. It is further being demonstrated that the power to produce cancer is associated with a special type of molecular structure in these constituents. This structure, like that of sterol, is one of condensed rings. The essential difference is that the sterol rings are hydrogenated, while the cancer-producing molecules are not. Hydrogenation indeed destroys the cancer activity of these radicles.

Now the molecular structure of the ovarian hormone, estrin, has the essential ring structure of a sterol, but one of the constituent rings is not hydrogenated. In a sense, therefore, the chemical nature of esterin links vitamin D with a cancer-producing substance. Further, it is found, that substances with pronounced cancer-producing powers may produce effects in the body like those of estrin. It is difficult when faced with such relations not to wonder whether the metabolism of sterol, which, when normal can produce a substance stimulating physiological growth, may in very special circumstances be so perverted as to produce within living cells a substance stimulating pathological growth. Such suggestions however, must with our present knowledge be cautiously received.

Considering, however, that the epoch-making discoveries in science have been built on hypotheses wholly without experimental proof, as for examples the electronic theory in physics and chemistry and the gene theory of heredity and biology, we cannot afford to disregard this great hypothesis. Organic chemistry would never have reached such heights were it not for the hypothesis of the benzene ring.

Ewing stated in an address before the American Society for the Control of Cancer that "there are ever so many interesting chemical and physical processes going on in cancer tissue, but the whole subject takes on a real meaning only when we learn that the entire play of forces is controlled by a hormone acting in exceedingly minute amounts."

Ferguson comments on the work of Jaffe and others on the relation of the parathyroids to osteitis fibrosa cystica and concludes by stating that "the biological approach to the study of disturbed endocrine physiology is a fertile and until recently untilled field of cancer research."

The parathyroid bodies developing as they do from the third and fourth branchial pouches may be situated anywhere from the cricoid cartilages down along the trachea and carotid arteries well into the thoracic cavity. The superior group developing from the third branchial pouch are fairly constant in position, although they may be within the substance of the thyroid gland and thus escape detection. The inferior group arising from the fourth branchial pouch varies considerably in number and position. In addition, numerous minute islands of parathyroid tissue may be scattered in the connective tissue and fat of the neck around the parathyroid glands proper and quite distant from them.

Dr. J. W. Lindsay made a special study, at my request, of a few subjects at necropsy with special reference to the location and character of the parathyroids which indicates very clearly that the number and position is by no means constant. He is impressed with the evident difficulty which would be presented in the attempt to locate and identify parathyroid glands at operation and the uncertainty which must follow as to the amount of such tissue remaining when one or more nodules have been removed. McCallum has charted the location of these glands based on 67 dissections in human subjects, and his work emphasizes the lack of uniformity in regard to their situation.

Hyperparathyroidism is not necessarily associated with parathyroid enlargement or an adenoma. This is well illustrated in the case reported by Hitzrot and Comroe. Their case presented a typical and completely disabling bone disease, but no enlarged parathyroids could be detected either before or during operation. At the first operation a normal gland was removed without clinical results. At a second operation 2 microscopically and histologically normal parathyroid glands were removed from the opposite side of the neck, and this was followed by complete recovery of the bone lesion, but the patient developed tetany. Ballin and Morse have removed apparently normal glands with clinical success.

Multiple adenomata of the parathyroids occasionally occur, but the question arises as to the advisability of their total removal, involving as they do so much parathyroid substance. Beck's case in which 3 parathyroid glands were removed, 2 of which were adenomatous, illustrates this point. His patient developed tetany on the fifth day and died on the twentieth.

The rationale of irradiation therapy in the control of secretory glands is sound. The informed individual no longer questions the efficacy of this form of therapy in its influence over salivary, ovarian, pituitary, or thyroid function, and there is no reason to believe that the parathyroids are an exception in this respect.

If there are contraindications to roentgen therapy for parathyroidism they have not yet appeared. The literature furnishes thousands of cases in which intensive roentgen therapy has been employed over the neck, and notwithstanding certain adverse opinions emanating from experiments on lower animals, we find no evidence in our own experience or in the literature to justify an opinion that irradiation of the cervical region is ever contraindicated in parathyroid disease of the human being.

In the treatment of malignant growths of the larynx and cervical region we have for the past year followed the technic recommended by Coutard. It is, of course, scarcely necessary to point out that the intensity of irradiation in Coutard's series is many times greater than that required to control either hyperparathyroidism or hyperthyroidism. In a communication to my associate, Dr. Lattman, answering an inquiry from him, he states he has "never observed a case of myxedema or tetany following irradiation of the neck." We have personally investigated, with the coöperation of Drs. Lindsay, Rice and Selinger, the blood calcium in 2 of our cases of malignancy of the cervical region, 1 of the larynx and the other of the cervical glands, each having received a total of 3,000 r at 200 K. V. over a period of 30 days. In 1, the blood calcium was 12.2 mg. and in the other 9.1 mg. per 100 cc. of blood.

We have not encountered, nor does the literature reveal a single case of tetany following roentgen therapy for any condition. Treatments for hyperparathyroidism are ordinarily given at intervals of 3 weeks. The exposure of 3 to 4 areas is recommended, 1 over each side of the neck, 1 over the upper thorax anteriorly, and 1 over the posterior neck. However, the number of areas and the interval between treatments are technical matters which vary with the individual case and with the voltages and filters employed.

Summary

Bone regeneration in cystic bone lesions has followed irradiation of the parathyroid region in the cases reported herewith. Prompt relief of pain has occurred in every case and has been noted before reparative changes in the cystic areas were demonstrable.

The social status and habits of all but one of this series leads me to believe that dietary insufficiency is not the basic cause of osteitis fibrosa cystica and allied osteopathies.

There is a possibility that vitamin D and parathormone may be factors in the production of cystic bone diseases which assume malignant characteristics.

The following case reports, with illustrations, are submitted for your consideration:

Report of Cases

Case 1: The patient, a single, white woman, aged 34 years was referred to me by Dr. Bullock of Washington. The family history was unessential. She had had the usual childhood diseases. She had always been well until January, 1928, when symptoms of hyperthyroidism developed. In addition to the cardinal signs there was a loss of weight of 40 pounds, insomnia, nausea and vomiting, and marked weakness. Prior to the subtotal thyroidectomy which was performed, August 14, 1928, the basal metabolic rate was plus 23 per cent. Subsequent to the operation there was a satisfactory general improvement to the point of "perfect health for a year," when nervousness returned, together with all of the previous symptoms of hyperthyroidism, which were thought by the patient to be "more severe than before the operation." In addition she complained of increasing stiffness and pain in the right knee, which finally, together with symptoms of hyperthyroidism, produced complete disability. She was admitted to Garfield Memorial Hospital by ambulance May 16, 1931. Physical examination revealed an emaciated woman, very nervous and apprehensive; the temperature was 98.6° F., the pulse 98, respiration 20. There was a pronounced tremor of the fingers, slight bilateral exophthalmos, the scar of a previous thyroidectomy with rather firm bilateral moderate enlargement of the thyroid gland above the scar. The heart and lungs were normal. The abdomen and viscera presented no demonstrable abnormality. The blood Wassermann was negative. The basal metabolic rate was plus 35 per cent. Blood, urine, and calcium determinations were not done. The weight was 95 pounds. The right leg was semiflexed and could not be manipulated without producing excruciating pain in the knee joint. The knee was slightly swollen. Radiographic examination of the right knee showed cyst-like areas of bone destruction involving the distal end of the femur with some periosteal proliferation. The cortex was not definitely expanded, nor did it have the appearance of invasion by malignant process. The periosteal reaction might be explained by the fact that the cortex was broken through in places, resulting in egression of fluid material through the subperiosteal spaces, with resulting bone proliferation. Examination of the chest and skull showed no abnormality. X-radiation was administered to 2 areas of the neck, including the thyroid and parathyroid areas. On June 6, 1931, 3 weeks after the first treatment, there was rather noticeable improvement in the patient's condition. There was some gain in weight, less nervousness, and a decrease in pulse rate (90). The pain in the right knee had disappeared almost entirely. Further roentgen treatment to the cervical region with the same dosage was given. On June 27, 1931, symptoms of hyperthyroidism showed marked improvement. The pain in the right knee had entirely disappeared. The patient was able to walk comfortably and felt very well. Radiographic examination of the right knee showed marked regeneration of the bone in the cystic areas previously noted. Further roentgen treatment was administered with the same dosage to the thyroid and parathyroids. On August 8, 1931, still further improvement was noted. Marked gain in weight to 116 pounds was observed; no symptoms or disability in the right knee remained. Roentgen ray treatment was again administered to the thyroid and parathyroids in same dosage. On August 29, 1931, the patient felt well, but was slightly nervous and had a slight tremor. There were no symptoms from or discomfort in the knee. Roentgen ray treatment to the thyroid and parathyroids in same dosage was repeated. Radiographic examination of the knee showed still further new bone formation in the cystic areas. On September 19, 1931, the patient weighed 120 pounds, and the tremor had disappeared. She was much less nervous. One more treatment to the thyroid and parathyroids was advised at this time. On October 12, 1931, the patient was requested to return for radiographic examination of the knee, at which time there was scarcely a trace of the original bone lesion or of hyperthyroidism. The patient was examined October 10, 1933, and found to be entirely well, and roentgenograms indicate complete bone regeneration.

Case 2: Shortly after the birth of the patient the mother suspected shortening of the right lower extremity; the measurements however, were normal, and an x-ray report made at that time indicated normal bones; however, a review shows a definite difference in the size between the epiphyses of the right and left femora, the right being smaller. Roentgen examination of the lower extremities, January, 1932, showed some shortening of the right femur, with demineralization in the distal extremity of the right femur, and definite bone changes in the head and acetabulum (figs. 1 and 2). This was interpreted as possible parathyroid disease; cystic disease of the femur and Perthes' disease were considered. This subject had 9 treatments at approximately monthly intervals from May, 1932, to November, 1932. They were discontinued, November, 1932, and a notation made that the bone lesions in the acetabulum and femur had healed. Dr. John Allan Talbot, of Washington, who referred the case, and, who, incidentally, insisted on the treatments, reports there has been definite improvement in the clinical signs, and there has been a gradual lengthening of the shortened femur, but that on May 15, 1933, there was still about $1\frac{1}{2}$ inches of shortening (figs. 3 and 4). The family history indicates that the paternal grandmother had shortening of the right leg, but this was associated with fracture of the hip; she also had a right clubbed hand; an aunt of the child died at 12, and there was an indefinite history of mental trouble and shortened right leg. There was nothing unusual in the clinical history of this patient; mentally the child is alert and further advanced than other children of her age. There was, however, a distinct growth of hair on the anterior aspect of the right thigh which was not present on the left, which suggests in this case the additional factor of pituitary dysfunction.

Case 3: The patient, a boy aged 6 years, was admitted to Children's Hospital Clinic, October, 1932; he had cut the left heel on a piece of glass; this healed without any complications. A month later he struck his heel and a slight swelling developed; there was no evidence of skin damage or ecchymosis; the heel was swollen and tender. The clinical impression was osteomyelitis. The leukocytes were 6,700, increasing a week later to 10,000; the temperature, pulse, and respiration were normal; the foot was placed in a plaster cast. Roentgen examination.

January 24, 1933, 3 months after the onset of symptoms, showed an extensive decalcification of the bones of the left foot and a definite area of destruction in the posterior and inferior portion of the os calcis which was thought to be inflammatory (fig. 5). At the request of Dr. John Allan Talbot, who suspected that the disease might be hyperparathyroidism, the child received 3 treatments over the cervical region at monthly intervals. The pain was entirely relieved following the first x-ray treatment and the cystic area in the os calcis had healed by May, 1933 (fig. 6). The blood calcium in this case was 8.9 mg. per 100 cc. at the beginning of treatments.

Case 4: The patient was a white woman, aged 62 years. She had fractured the right hip in 1927; complete union followed. In September, 1930, she fractured the right hip at the same site, and cystic areas were noted in the proximal third of right femur. There was no union. In the late fall of 1932 she developed pain in the right shoulder, right hip, and lower back and became bedridden with intense pain. Roentgen examination disclosed cystic changes in the femora, pelvis, lumbar vertebrae and the right clavicle (fig. 7). The diagnosis made at that time was hyperparathyroidism, producing osteitis fibrosa cystica. Roentgen therapy was not instituted, however, until May, 1933. Six series of treatments over the cervical region were given at intervals of 3 weeks. The pain has been completely relieved and the general health is much improved. The previously bedridden patient is now up and about. There is definite regeneration of the cystic areas, and a bony union between the femur and ilium is being established (fig. 8).

Case 5: The patient was a white man, 60 years of age, whose history was unessential until March, 1929, when he began having pain along the left tendo achillis. This was followed by pain and tenderness in both hands, forearms and shoulders. The blood calcium at this time was 12.8 mg. per 100 cc. of blood. In November, 1929, the patient was "seriously crippled" and consulted Dr. Joel E. Goldthwait of Boston, who found chronic arthritis with decalcification of the bones. He returned to his home in Washington, and consulted Dr. Arthur C. Christie on November 29, 1932. Dr. Christie made a diagnosis of hyperparathyroidism based on the presence of cystic areas in the lower ends of the left radius and ulna, the pain and the blood chemistry. The blood calcium was 12.6 mg. and the serum phosphorus 1.96 mg. per 100 cc. of blood. Ten roentgen treatments were given over the cervical region at intervals of 3 weeks. There was a slight improvement in the cystic areas in the radius and ulna and a diminution in the pain following the second treatment. By June 29, 1933, the patient was clinically well. The blood studies at that time showed 9.03 mg. of calcium and 4.0 mg. of phosphorus per 100 cc. of blood. An insufficient time has elapsed to show complete healing in the cystic areas.

Case 6: A white woman, 70 years of age, consulted us on October 28, 1932. The past history was of no importance until April, 1932, when the patient developed pain in the lower back and the lower extremities. The pain became progressively more severe and gradually extended over the entire back. She was unable to walk and suffered intensely even in the recumbent position. Roentgenograms of the spine showed extensive decalcification and compression of the bodies of all of the lumbar vertebrae and most of the dorsal. Roentgen therapy was applied, 6 treatments being given over the cervical region at intervals of 3 weeks. There was marked diminution in the intensity of the pain following the first treatment, and the patient was free of pain following the third treatment. On June 6, 1933, 8 months after the first treatment, the patient was very comfortable and was able to be up and attend to her usual duties.

Case 7: A single, white woman, aged 53 years, was referred by Dr. Bullock, Washington. She was well nourished but appeared to be 10 years older than her stated age. The family history was unessential. She had had increasing intermittent pain and lameness in the left leg for the past 2 or 3 years. The general examination was negative, except for deformity of the right leg. The blood examinations were normal. X-ray examination showed a saber-shaped tibia presenting the characteristic changes of osteitis deformans. Roentgen therapy over the cervical region at 3-week intervals was given for 4 treatments. Following the second treatment roentgenograms showed definite change in the architecture of the bone; there was an appreciable diminution in the calcium content of the tibia, the cortices were much less dense, and there was an actual decrease in the diameter of the bone. The patient had less pain and felt better. There was no subsequent change in the roentgen findings. A letter from the patient dated October 8, 1933, stated in reply to our inquiry: "I am most happy to say I have never had an ache or a pain in my knee or leg since the last treatment." This was confirmed by Dr. Bullock. (In the experience of Dr. F. O. Coe and Dr. Claude Moore of Washington, relief of pain has been noted in cases of osteitis deformans following irradiation of the parathyroid region.)

Case 8: A white man, 35 years of age, was admitted to the Veterans' Hospital, Washington, D. C., May 27, 1927. The past history was unessential until April, 1925, when he was hospitalized on account of a growth on the back of his head and enlargement of the post-cervical glands. He complained at that time of intermittent headache and left earache. The growth and glands slowly increased in size while he was in the hospital until December, 1926. The headaches became more frequent and there was "a gradual loss of natural strength, especially since the head and glands started swelling." He "noticed trouble with the arms and legs, like paralysis, for some time." On admission to the Veterans' Hospital, May, 1927, the patient was found to be well developed, but poorly nourished. There was a cardiac arrhythmia, but no organic heart disease. The thorax and abdomen were negative. There was a mild secondary anemia. The blood Wassermann test was negative. The report of the examinations by the radiologist and surgeons is as follows: "There is a very great degree of erosion of the post-occipital region and the parietal bones (figs. 9 and 10). There is an enormous, symmetrical, semifluctuant tumor, containing rather firm nodules, beneath the scalp, covering the entire occipital region. There are large glands in the suboccipital area and below the left mastoid. Surgical interference is impossible. Gland to be excised for biopsy." The pathological report was "small round cell sarcoma." Deep roentgen treatment over the skull, laterally and posteriorly, was given at Garfield Memorial Hospital. Hospitalization was continued at another Veterans' Hospital until March 29, 1928. Following the roentgen therapy there was complete depilation of hair with desquamation of the epidermis. He was re-admitted to the Veterans' Hospital, Washington, D. C., March 29, 1928. He had been confined to bed during the previous month and treated for anemia. He complained of dizzy spells and trembling, had dyspnea and precordial pain. There was a mucopurulent, blood-tinged nasal discharge. There had been no change in the size or character of the tumor on the head, and the cervical glands were the same. A neurological examination was negative except for asthenia and muscular weakness thought to be secondary to the tumor. Additional roentgen therapy was given at Garfield Memorial Hospital; this produced complete depilation and intense erythemia with some vesication. Surgical opinion rendered in April, 1928: "Remarkable transformation; enormous mass decreased to 1 or 2 small nodules on the left side of the original growth." Roentgen examination showed an increasing calcification in the skull. He was discharged for observation elsewhere, May 28, 1928. When re-admitted to the Veterans' Hospital, Washington, D. C., October 26, 1928, the patient presented the cardial signs and symptoms of moderately severe thyrotoxicosis. The basal metabolic rate was plus 34 per cent, and the subject complained of great weakness and inability to walk at times. A bony tumor of the left clavicle was noted and found to be a pathological fracture through a bone cyst. Roentgen therapy was given over the cervical region, 6 treatments at 3-week intervals. The patient's condition was definitely improved when discharged from the hospital on May 15, 1929. In November, 1932, he was in good health, and the skull and clavicle had been restored to normal, although there was non-union of the pathological fracture of the clavicle (figs. 11 and 12). He remains well and free of symptoms at the present time, 4½ years since the initial treatment and 8½ years since the onset of symptoms. The diagnosis in this case is based largely on the therapeutic response to irradiation of the parathyroids and suggests the advisability of such a therapeutic test in all obscure bone lesions.

N.B.: Reproductions of X-ray films of cases 1, 5, 6, and 7 are not published here because they have been or are being used in articles in other journals.

BIBLIOGRAPHY

Askanazy, M.: Beitrage zur Knochenpathologie ueber Kalkmetastase und Progressive Knochenatosophie. Festschr. f. Max Jaffe f. Vieweg und Sohn. Braunschweig, 1901, p. 208.

Ballin, M., and Morse, P. F.: Parathyroidism and Parathyroidectomy. Ann. Surg., 1931, **94**, 592.

Beck, A.: Discussion of Case of Osteodystrophia Generalisata. Arch. f. klin. Chir., 1928, **152**, 123.

Bloom, A. R.: Osteitis Fibrosa Cystica Due to Hyperparathyroidism. Radiology, 1931, **17**, 1,304.

Bromer, R. R., and White, C.: Personal communication.

Camp, J. D., and Ochsner, H. C.: The Osseous Changes in Hyperparathyroidism Associated with Parathyroid Tumor. Radiology, 1931, **17**, 63.

Coutard, H.: Personal communication to my associate, I. Lattman.

Erdheim, J.: Zur normalen und pathologischen Histologie der glandula thyreoidea, parathyreoidea und Hypophysis. Beitr. z. path. Anat. u. z. allg. Path., 1903, **33**, 158.

Ferguson, R. S.: Personal communication.

Ferguson, R. S.: Quantitative Behavior of Prolan A in Teratoma Testis. Am. J. Cancer, 1933, **18**, 269.

Ginsberg, S.: Bone Metastasis in Thyroid Tumors; Early Diagnosis and Radiotherapy. Am. J. Roentgenol., 1927, **18**, 203.

Gley, E., Vassale, G., and Generali, G.: Editorial—How Indispensable are the Parathyroids? J. A. M. A., 1933, **101**, 1,003.

Hahn, O.: From the Ponderable to the Imponderable. Science, 1933, **77**, 397.

Hitzrot, L. H., and Comroe, B. I.: Hyperparathyroidism Without Parathyroid Tumor. Arch. Int. Med., 1932, **50**, 317.

Hopkins, F. G.: Some Chemical Aspects of Life. Science, 1933, **78**, 219.

Hunter, D.: Goulstonian Lectures entitled the Significance to Clinical Medicine of Studies in Calcium and Phosphorus Metabolism. Lancet, 1930, **1**, 897, 947 & 999.

Jaffe, H. L., Bodansky, A., and Blair, J. E.: The Sites of Decalcification and of Bone Lesions in Experimental Hyperparathyroidism. Arch. Path., 1931, **12**, 715.

Kozelka, F. L., Hart, E. B., and Bohstedt, G.: Growth, Reproduction and Lactation in the Absence of the Parathyroid Glands. J. Biol. Chem., 1933, **100**, 715.

Mandl, F.: Therapeutischer Versuch bei einem Falle von Ostitis fibrosa generalisata mittels Exstirpation eines Epithelkörperchentumors. Zentralbl. f. Chir., 1926, **53**, 260; Zur Frage der Exstirpation eines Epithelkörpertumors bei der allgemeinen Ostitis fibrosa. Ibid., 1929, **56**, 1,739.

Masson, J. C., and Mueller, S. C.: Ovarian Tumors of Thyroid Tissue. Surg. Gynec. & Obst., 1933, **56**, 931.

McCallum, W. G.: Anatomy of the Parathyroid Gland. Lewis' Practice of Surgery. Hagerstown, W. F. Prior Company, Inc., 1929, **6**, 1.

Merritt, E. A.: Irradiation of the Parathyroids in Cystic Disease of the Bones. J. A. M. A., 1932, **98**, 1,733.

Moore, C.: Personal communication.

Oppel, V. A.: Einige Bemerkungen über die Hyperfunktion der Epithelkörperchen. Endokrinologie, 1930, **6**, 11.

Samuels, L. T., Ball, H. A., and Simpson, W.: The Relation of the Hypophysis to the Growth of Malignant Tumors. Am. J. Cancer, 1933, **18**, 380.

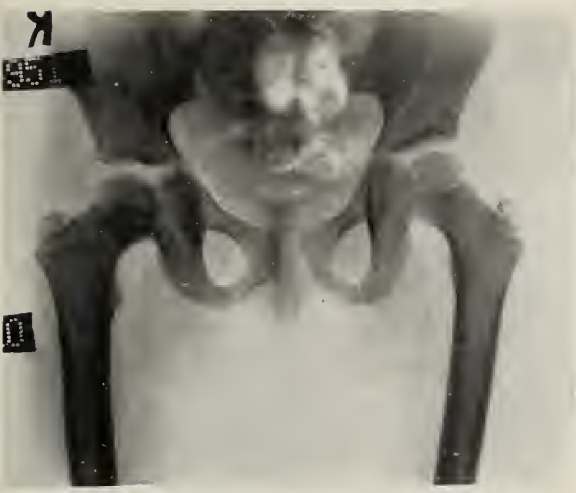


Fig. 1

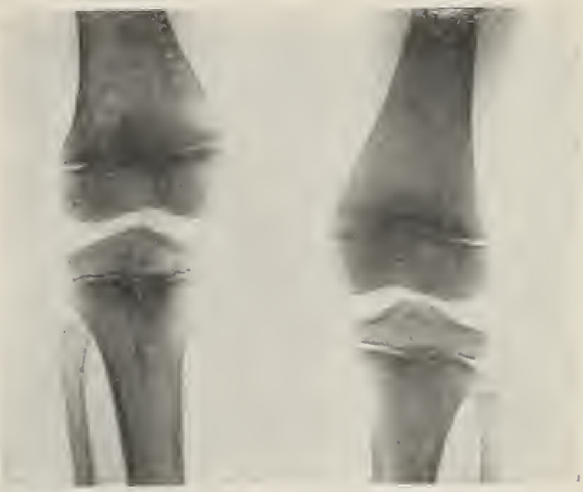


Fig. 2

(Case 2)

Extensive bone changes are present in the right acetabulum, the epiphysis and metaphysis of the right femur, the epiphysis and metaphysis of the right tibia.

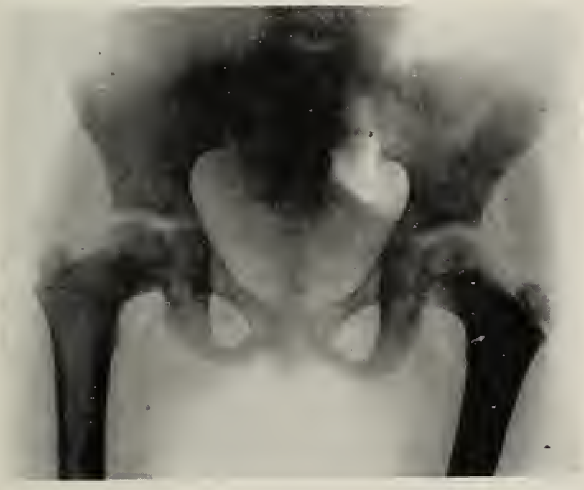


Fig. 3

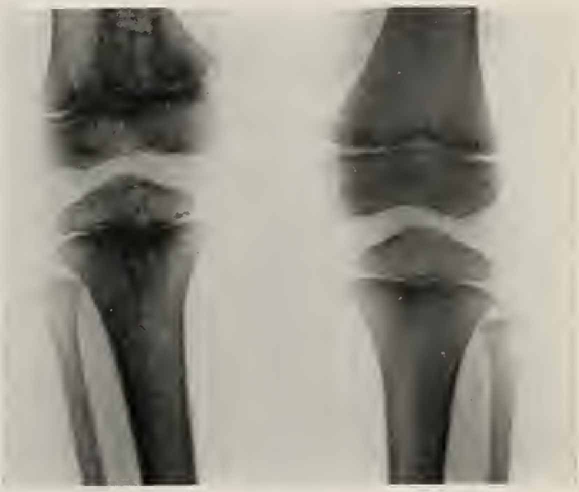


Fig. 4

(Case 2)

Appearance of the bone lesions after 9 treatments over the cervical region at the expiration of 18 months.

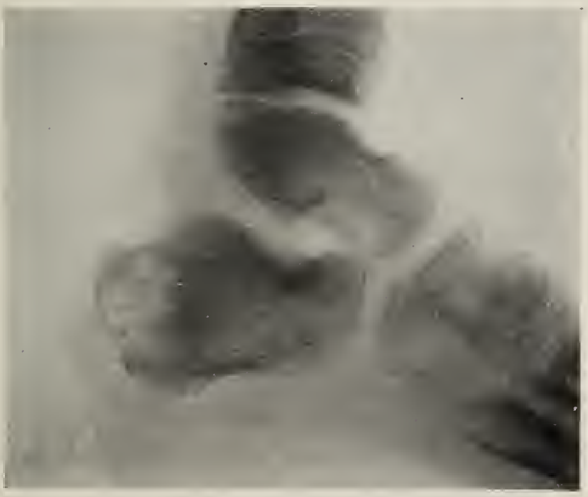


Fig. 5 (Case 3)

Cyst in the os calcis before treatment over the parathyroids.

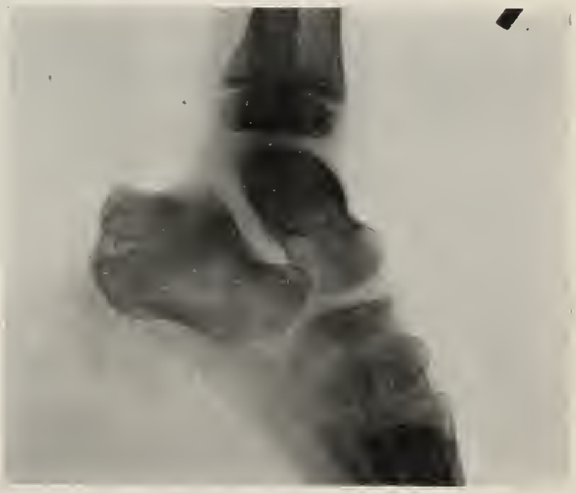


Fig. 6 (Case 3)

Complete healing at the expiration of 3 months after X-ray treatment.

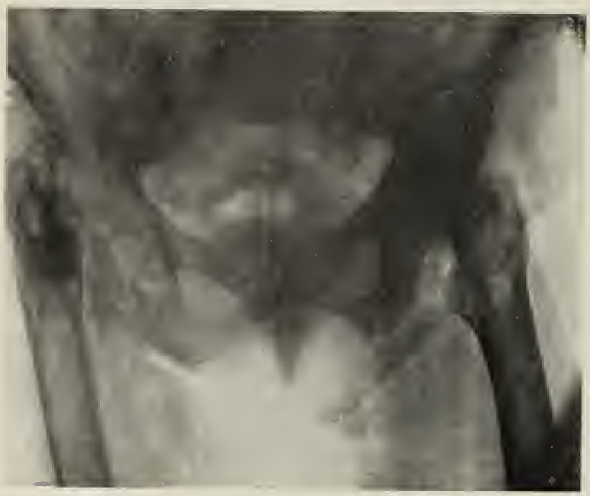


FIG. 7 (CASE 4)
Osteitis fibrosa cystica, with non-union of fracture of surgical neck of right femur.

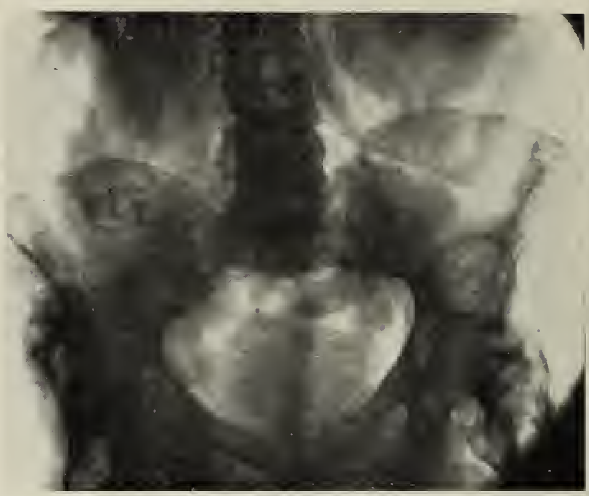


FIG. 8 (CASE 4)
Bony union between ilium and femur following 6 treatments over the cervical region with complete relief of pain.

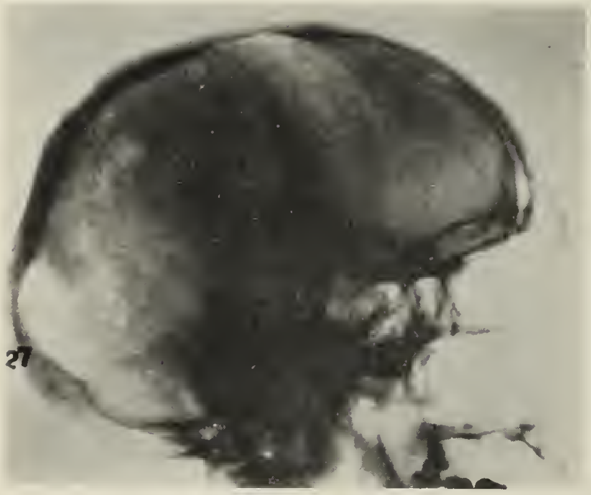


FIG. 9

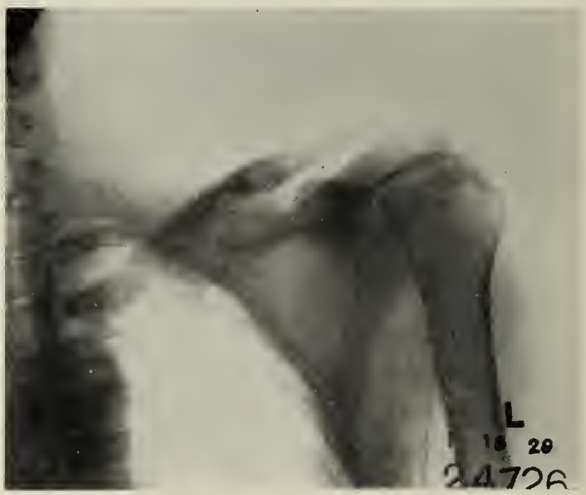


FIG. 10

(CASE 8)
Skull and clavicle at the beginning of treatment, 1927.

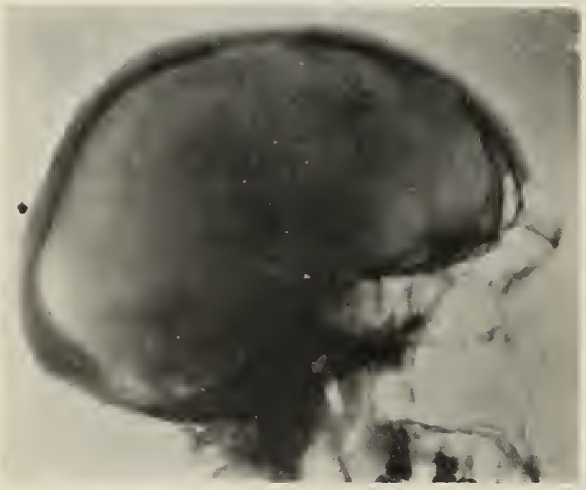


FIG. 11

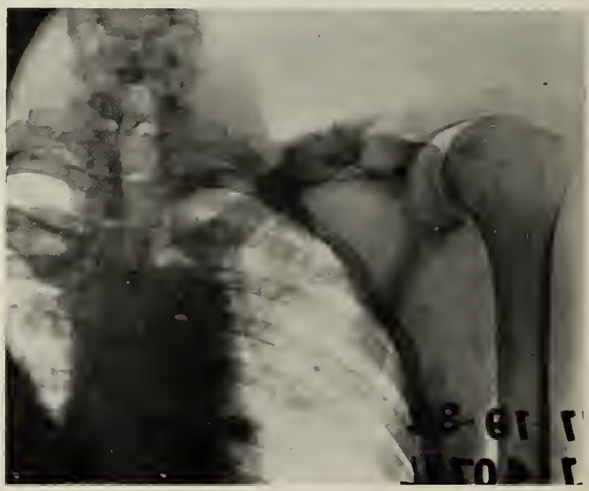


FIG. 12

(CASE 8)
Skull and clavicle at the conclusion of treatment, 1932.

The Fundamentals of Internal Medicine*

DISEASES OF THE HEART†

Wallace M. Yater, M.D.
Professor of Medicine, Georgetown University School of Medicine

CONTENTS

Introduction
Cardiac Reserve
Heart Failure
  1. Congestive Failure
  2. Anginal Failure
Etiologic Types of Heart Disease
  Hypertensive Heart Disease
  Arteriosclerotic Heart Disease
  Rheumatic Heart Disease
  Syphilitic Heart Disease
  Hyperthyroid Heart Disease
  Congenital Heart Disease
  Bacterial Endocarditis
  Acute Pericarditis
  Chronic Adhesive Pericarditis
  Pulmonary Heart Disease
  Other Etiologic Types and Considerations
Cardiac Neurosis and Neurocirculatory Asthenia
The Arrhythmias and Electrocardiography
Diagnosis of Heart Disease and Heart Failure
Treatment of Heart Disease and Heart Failure

Introduction

Heart disease is one of the commonest causes of illness and death. It becomes increasingly so with the conquest of the infectious diseases of childhood and early adult life. More people are living to the age when heart disease is most prevalent. Also, the stress and strain of modern life have increased the incidence of heart disease due to hypertension and coronary arteriosclerosis in relatively young men.

The heart is a strong organ. It does not fail on slight provocation. Heart failure from acute disease is usually due to an overwhelming infection of the heart itself, the most common forms being acute rheumatic myocarditis or pancarditis and diphtheritic myocarditis. Heart failure is rarely the cause of death in other acute infectious diseases, although naturally the heart must stop beating before an individual is dead. Death may occur in pneumonia and other infectious diseases largely as a result of circulatory failure, but it is the peripheral circulation which fails first, the arterioles of the body relaxing so that the peripheral resistance drops. The heart is not able to do its work under such a condition, but if the peripheral resistance could be restored it would be capable of performing its duty satisfactorily. The same situation maintains in surgical shock with its acute vascular relaxation.

Of most concern is chronic heart disease, which is very common. Most chronic heart disease is due to one or sometimes more of five main etiological factors: hypertension, coronary arteriosclerosis, rheumatic infection, syphilis and hyperthyroidism. If one attempts to establish the etiological factor in each case of heart disease the major portion of the diagnosis is made. It is not always possible, however, to determine the etiological factor.

Chronic heart disease may exist without symptoms for a long time, perhaps years. The onset of failure is often insidious. Months usually elapse before death occurs. In hypertensive heart disease failure is slow but progressive. In syphilitic heart disease failure is somewhat less slow but continuous. In cases of coronary arteriosclerosis failure is frequently sudden, due to occlusion of a coronary artery, and previously symptoms may not have been noted. With rheumatic heart disease the heart may 'break down' time after time over a period of years. Cardiac decompensation due to hyperthyroidism is relatively rare and comes usually after years of illness in late middle life.

Less common causes of chronic heart failure are adhesive or constrictive pericarditis, myxedema, severe anemia, congenital heart disease, bronchial asthma and emphysema, thoracic deformities, cardiac trauma, arteriovenous aneurism, continuous fast heart rates and tumors of the heart. Subacute bacterial endocarditis rarely causes death from heart failure, but usually from septicemia, embolic lesions and nephritis.

---

* This is the first of a series of articles on subjects concerned with the everyday practice of medicine. The object of these papers is to familiarize the older practitioners with the newer concepts of various diseases and groups of diseases, and to review for the more recent graduates in medicine the diseases with which they are coming in contact in their daily practice.

† Since a discussion of diseases of the heart naturally can not be covered entirely in one issue of the Annals, this subject will be continued from month to month until it has been concluded.

In making the diagnosis of heart disease one must, if possible, include the etiological factor, the functional state of the myocardium and the pathologic lesion.

Chronic heart disease is naturally always serious, but not always hopeless. Life may often be prolonged, sometimes greatly, by proper treatment.

Cardiac Reserve

The reserve capacity of the heart is great. Normally, at rest the minute output is from 5 to 8 liters of blood, the output per beat (stroke volume) being from 70 to 120 cc. With strenuous exertion, such as running, the minute output may reach 30 to 40 liters, with a stroke volume of 170 to 220 cc. The pulse rate rises to 150 to 180 per minute. Taking 5 liters as the normal volume of blood, an amount equal to the blood volume is discharged each minute from each ventricle. With strenuous exertion, over 6 times the blood volume (about 8 gallons) may pass through each ventricle per minute. This great amount of work that the heart may perform when required is the reserve capacity of the heart. When the heart is weakened by disease, the amount of work it may perform is gradually decreased until finally it is capable of doing under any condition less work than it can normally do at rest.

Heart Failure

Heart failure is of two types: congestive and anginal. Congestive failure may occur in all types of heart disease, no matter what the etiological factor may be, whereas anginal failure occurs practically only in cases of coronary arteriosclerosis and syphilitic aortitis with occlusion of the orifices of the coronary arteries.

1. Congestive Failure. The symptoms of congestive failure are more or less the same in all cases. If the left ventricle fails first, as it does in essential hypertension, coronary arteriosclerosis, lesions of the aortic valve and mitral endocarditis with regurgitation predominating, the left ventricle is unable to pump out the blood as fast as it is delivered to it from the lungs through the left auricle, and pulmonary venous stasis results, with diminution of the vital capacity of the lungs, increasing dyspnea ("shortness of breath") on exertion and finally even at rest (orthopnea), and signs of congestion of the lungs. Dyspnea on exertion often precedes other signs of congestive failure for months or even years.

Sooner or later, the right ventricle, attempting to pump the blood through the engorged vessels of the lungs, fails also, and since it can no longer expel all of the blood brought to it from the veins of the systemic circulation, the right auricle and the veins of the body become engorged also, and as a result fluid accumulates in the tissues generally and especially in the subcutaneous tissues, particularly of the dependent parts of the body. The liver becomes swollen, palpably enlarged, smooth and tender. Pitting edema of the ankles occurs, at first disappearing over night but later persisting; and finally pitting edema of the lower extremities results, or even of the trunk and genitalia, but rarely of the upper extremities. Passive effusions may collect in the serous cavities, especially the peritoneum and one or both pleural cavities and even the pericardial sac. When the edema is more or less generalized anasarca is said to exist. From then on a fatal termination is always imminent.

The same series of events occurs if the right ventricle fails first, as in cases of mitral stenosis and emphysema, except that venous stasis occurs first in the systemic circulation, although with mitral stenosis there may previously have been pulmonary congestion because of obstruction to the blood leaving the lungs. When the right ventricle fails, the left ventricle receives less blood, and consequently the coronary vessels and the systemic arteries receive less blood to nourish the myocardium and other vital organs.

Congestion of the lungs is determined by diminution of resonance at the bases posteriorly and by subcrepitant (fine, moist), inspiratory râles in this region. As the congestion becomes edema in the later stages of congestive failure, moist, bubbling râles over the entire lung fields and palpable rhonchi are elicited. A cough may result, and in more rapidly occurring pulmonary edema, frothy, blood-tinged sputum may be expectorated. The patient must be erect or sitting to breathe when pulmonary congestion is severe, and respiration is shallow and labored (orthopnea). The dyspnea is then usually most severe at night. Cyanosis of the lips and finger nails, or even generally, is noted.

In congestive failure the heart is found to be dilated much out of proportion to the amount which naturally accompanies hypertrophy. This dilatation is evidenced by great extension of the area of cardiac dulness both to the right and to the left, and by a waviness and wide extension of the visible and palpable pulsation of the heart over several interspaces in the precordial region. The normally booming tone of the first sound at the apex often becomes replaced by a muffled or slapping sound. Gallop rhythm may be noted in some cases. This rhythm is produced by an extra or even two extra heart sounds with each beat. The extra sound, if there is only one, either follows the second sound (protodiastolic gallop) or precedes the first sound (presystolic gallop). If two extra sounds are present one is protodiastolic, the other presystolic. Gallop rhythm should not be confused with the physiological third heart sound which is sometimes heard in young people without heart disease. Nor should it be confused with the "splitting" or reduplication of the first sound at the apex or reduplication of the second sound at the base which may or may not be associated with heart disease. Reduplication of the first sound may or may not be associated with heart disease. Reduplication of the first sound may be a sign of bundle branch block (v. i.), and reduplication of the second pulmonic sound may occur in cases of mitral stenosis (v. i.).

Various arrhythmias may occur in congestive heart failure without specific diagnostic significance. The most frequent are premature contractions (extrasystoles) and auricular fibrillation (v. i.). Pulsus alternans is sometimes observed and is of bad omen.

A systolic, usually blowing murmur may or may not be heard at the apical or basal regions or both, over the precordium or even over most of the chest. This has no specific significance in most cases. A systolic apical murmur in cases of congestive failure usually denotes relative or functional mitral regurgitation, due to stretching of the left auriculoventricular orifice. One must never forget that a systolic apical murmur existing without other signs of heart disease or without evidence of congestive failure usually does not mean that heart disease exists.

The pulse rate in congestive failure may or may not be increased. When auricular fibrillation exists it is usually considerably increased before digitalization is induced. If auricular fibrillation exists the pulse is totally irregular, and there is a pulse deficit, i.e., the pulse rate is not as great as the heart rate. If premature contractions occur the pulse is irregular, but not totally; there are runs of regular beats interspersed with small beats followed by pauses, or only pauses, as if beats had been dropped out.

Blood pressure changes in congestive heart failure are not usually prominent except in some cases of essential hypertension, in coronary thrombosis, and terminally.

Occasionally in congestive failure a previously orthopneic patient is suddenly able to breathe quietly when recumbent. Such a change indicates that tricuspid regurgitation has occurred. The patient appears to be better but is actually worse. The tricuspid valve is dilated and the engorgement of the pulmonary circulation is relieved, the right ventricle now pumping blood back into the right auricle and the venae cavae as well as into the lungs. Consequently the veins of the neck are engorged and pulsate. One must not be misled by pulsation of the veins of the neck, however. In congestive failure the veins are often engorged because of the general venous stasis and increased venous pressure, and the pulsation of the carotid arteries may be transmitted to the veins. In order to ascertain whether there is actually pulsation of the veins one must milk one of them dry with the fingers and determine whether it is filling from below as well as from above. If the vein fills readily from below tricuspid regurgitation exists and the pulsation is really of the veins. When tricuspid regurgitation exists there may be a systolic murmur over the tricuspid area (lower sternal region), but this is not always evident. The swollen liver like the engorged veins of the neck may pulsate, but pulsation of the liver is more difficult to ascertain. Confusion often exists because the pulsation of the abdominal aorta may be transmitted to the liver.

When fluid occurs in appreciable amount in the peritoneal cavity the abdomen is distended, a fluid wave may be elicited, and there is shifting dulness in the flanks. The presence of a transudate in the pleural cavity (hydrothorax) more often the right, gives the usual signs of a pleural effusion, viz., absent tactile fremitus, flatness, and distant or absent breath and voice sounds. Hydropericardium is least easy to determine because the heart is usually large and the signs of dilatation most prominent.

Venous stasis in the kidneys (passive congestion of the kidneys) usually causes oliguria, sometimes pollikiuria, commonly albuminuria, cylindruria and microscopically demonstrable erythrocytes. There may be some nonprotein nitrogenous retention in the blood, rarely over 75 mg. per 100 cc., and some diminution in function as determined by the phenolsulphonephthalein test of renal function (always performed by injecting the dye intravenously when edema of the subcutaneous tissues is present).

Passive congestion of the gastro-intestinal organs may cause indigestion and even rarely vomiting.

The spleen is practically never enlarged.

Infarcts may form in the lungs because of the venous stasis. Thrombi may form in the auricular appendages, especially when auricular fibrillation is present, and portions may be thrown off into the circulating blood. If they come from the right auricle they lodge in the arteries of the lungs and cause infarcts, whereas if they come from the left auricle they may go to any organ in the body, most often the kidneys, spleen, brain, extremities and mesentery. When the left ventricle is greatly dilated, and especially after coronary thrombosis, a thrombus may form in the left ventricle (mural thrombus), and part of it may break off and be thrown into the systemic circulation.

The accumulation of edema causes an increase in the weight of the patient, although with prolonged congestive failure and after removal of most of the edema by treatment the patient may become emaciated and lose weight. He then becomes pale, "drawn," weak and mentally confused.

Headache, nervousness and insomnia are not uncommon in congestive failure. Precordial oppression and palpitation of the heart ("heart-consciousness") are sometimes complained of.

Severe dyspnea may cause an apparent protrusion of the eyeballs and a staring expression.

To summarize, the main symptoms and signs of congestive failure are:

1. Dyspnea, first on exertion and later when recumbent (orthopnea).
2. Passive congestion of the lungs, with dulness and subcrepitant râles at the bases.
3. Enlargement of the liver.
4. Pitting edema of the lower extremities and sometimes of the genitalia, trunk and rarely even the upper extremities (anasarca).
5. Serous accumulations in the serous cavities, namely ascites, hydrothorax, hydropericardium.
6. Engorged veins of the neck.
7. Sometimes positive venous pulsations in the neck (tricuspid regurgitation).
8. Signs of excessive dilatation of the heart.

9. Various cardiac arrhythmias.
10. Pulmonary infarcts and sometimes embolic phenomena.
11. Finally pulmonary edema and cyanosis.

2. ANGINAL FAILURE. Anginal failure frequently occurs in the absence of congestive failure, but sometimes the two types of failure co-exist. Anginal failure is common in cases of coronary arteriosclerosis. It occurs also in those cases of syphilitic aortitis in which the orifices of the coronary arteries are occluded, partially or wholly.

Pain is the outstanding symptom of anginal failure. In the syndrome known as angina pectoris, first described accurately by Heberden in 1768, paroxysmal attacks of substernal pain or oppression occur, usually in the upper or middle sternal region. They are usually brought on by exertion, excitement or the eating of a heavy meal, but in severe cases they may come at any time, day or night. The pain may last a few seconds to half an hour, usually two or three minutes. It is relieved by rest or some vasodilator, such as nitroglycerin or amyl nitrite. The patient is usually greatly disturbed, fearing he may die. The pulse rate changes but little; the blood pressure may be slightly elevated.

The pain may occur in other places except those mentioned, viz., the precordium, lower sternal region, subclavicular region, neck or face, back, hand or arm, epigastrium. It is usually felt later, however, under the sternum. The pain frequently radiates a variable distance down the arms, most often the left. The patient may urinate abundantly after an attack.

The attack may last for years but usually not so long. The patient may die because of some unrelated condition or he may die in a severe anginal attack.

The exact mechanism of angina pectoris is uncertain, but it is probably a relative myocardial anoxemia. The narrowed or obstructed coronary stream bed is not capable of carrying sufficient blood for the increased demands of exertion, etc.

Pain is a prominent feature of occlusion of a coronary artery, usually by a thrombus formed in situ. This occurs always in coronary arteries the seat of sclerotic changes. The pain is substernal, and is usually more severe and more protracted than in angina pectoris. It is not relieved by vasodilating drugs. Morphine may relieve it wholly or only partially or not at all. A variable degree of collapse, fall in blood pressure, tachycardia and other symptoms not found in angina pectoris occur (v.i.). The patient may or may not have had angina pectoris previously. Coronary thrombosis is frequently fatal.

Cardiac asthma, while not strictly confined to the subject of anginal failure, may be discussed here because it is frequently an evidence of coronary arteriosclerosis. It may occur, however, in any case of heart disease in which the left ventricle is subjected to the greatest strain, as in hypertensive heart disease and aortic valvular disease. Cardiac asthma may occur unassociated with congestive heart failure, in which case it is usually called paroxysmal dyspnea. When it occurs in association with congestive failure it is usually called cardiac asthma.

Cardiac asthma, and paroxysmal dyspnea, is a sudden attack of asthmatic dyspnea, sometimes brought about by exertion or overeating, but occurring most frequently during sleep. The attack may last for minutes or for hours. It may be mild, moderate or severe. Sometimes it terminates in pulmonary edema and death.

The mechanism of cardiac asthma is acute failure (dilatation) of the left ventricle, causing engorgement of the pulmonary vessels, with or without râles, and producing some effect upon the nervous mechanism of respiration.

(*To be continued*)

SEXUAL FRIGIDITY IN WOMEN*

Walter R. Stokes, M.D.
Washington, D. C.

My choice of the subject of this paper has arisen spontaneously from the experiences of many consultations upon problems of the domestic relationship. Through such marital adjustment service I have come to a conviction that in an overwhelming majority of cases discord is founded in sexual incompatibility, which in turn is generally to be interpreted either as inadequate sexual performance in the husband or, still more frequently, as inadequate responsiveness in the wife.

Let there be no uncertainty: this question of deficient sexual responsiveness is one of enormous importance to the sum of human happiness. As proof I would cite the romantic disillusionment it may bring to both husband and wife and its vast influence in causing husbands to seek sexual satisfaction outside marriage, which in turn often leads to the introduction of venereal infection into the family circle. In its indirect way sexual frigidity is a truly outstanding factor in the dissemination of venereal infection, in the development of horrible jealousies, in the destruction of romance and affection, and in the breaking up of homes. Nevertheless the subject is one which has as yet received comparatively scant scientific attention and almost no general medical notice. The public ignorance concerning it is still utterly abysmal except as to an excellent knowledge of its bitter fruits.

I believe that we may gain the clearest concept of female unresponsiveness after considering first the more easily understood mechanism of impotence in the male. The latter is usually the result of a defect in the psychological erection mechanism so that adequate erection for intercourse can not be obtained. In its advanced form it is an absolute bar to sexual relations. In its milder forms it appears as premature or hasty ejaculation. In any case it is a psychologically induced loss of anatomical ability to perform the sexual function. In woman such an anatomical result does not occur. Although she may undergo the some psychological reactions that induce impotence in the man, still her anatomical capacity for sexual relations is not appreciably impaired. Under such circumstances she does not display the usual genital excitement phenomena of voluptuous sensation, increased mucous secretion, erection of the clitoris, and orgasm, but she is nevertheless not incapacitated for relations, for unless there is severe psychic vaginismus the introitus may still be entered and the act completed by the man without her active participation and with little or no diminution in the probability of an ensuing pregnancy. Under these conditions she is said to be frigid rather than impotent, although the underlying psychological background is commonly of the same character in the two disorders. In each case it is a question of inhibitions, fears, or aversions associated with sexual union. A curious thing is that both frigid women and impotent men are often possessed of an extremely active libido which makes them insatiable with romantic desire, yet at the point of physical realization their inhibitions or abnormal phantasies rise up to thwart and damn them. A more unhappy emotional complex probably does not exist.

Advanced degrees of frigid sexual reaction are characterized by a dyspareunia for the physical cause of which gynecologists are constantly searching in vain. The patient complains bitterly of discomfort and pain attendant upon relations, yet a routine pelvic examination reveals no supporting evidence. The explanation is simply that there exists an inner aversion to sexual relations which totally inhibits the lubricating function of the introital mucous glands and sets up a tonic spasm of the introital sphincter muscles. It is small wonder that actual pain accompanies entrance of such a dry, spastic introitus.

Many writers upon inadequate female sexual responsiveness have spoken of sexual anesthesia, by which term they refer to an entire congenital absence of local sexual responsiveness. Personally I am unable to conceive of absolute sexual anesthesia in a healthy adult person. It is true that peculiar conditioning of the sexual response may set up a requirement of very bizarre or abnormal stimuli, perhaps quite different from those of normal heterosexual relations, yet basic sexual responsiveness is far too powerful ever to be totally obliterated. It is one of the few elemental and never-failing endowments of every living organism. It may be most curiously subverted or perverted but it can not be eradicated. The typical case of so-called sexual anesthesia is one in which response is withheld because available stimuli are not adequate. There is either a special aversion or erotic desires run in some other direction. Accordingly we must look upon the classical concept of sexual anesthesia not as a state of absolute frigidity but as a type of frigid behavior under special emotional conditions. It would be better if the term "sexual anesthesia" were dropped from our literature, for it connotes a confusing idea of a local anesthesia, proof against all stimuli. Barring certain rare lesions of the nervous system such a condition simply does not exist.

---

* Read before the Society, October 18, 1933.

Much has been written upon anatomical factors as a cause of unresponsiveness in women. Emphasis has been placed upon the location of the clitoris relative to the introitus. After checking this factor in over 200 cases I am unable to concede it any appreciable significance. It has been believed by some that inadequate exposure of the clitoris, due to an excessive amount of overlapping preputial tissue, may diminish responsiveness. My observations in clinical practice have developed nothing to support this assumption. In 2 cases I have experimentally performed circumcision of the clitoris with no improvement in responsiveness. Both of these cases later showed striking improvement following psychotherapy.

What has been said thus far is by way of leading to the conclusion that frigidity is merely an aversion to or a disinterest in what is offered of a sexual nature. To illustrate this concept I shall classify the commoner causes of frigidity, listing them under two headings: first, those in which the woman seems to deviate most from the normal expectation, and second, those in which the man appears to deviate most.

Causes inherent in the attitude of the woman:

1. A strict romantic idealism in which virginal frigidity is glorified and sexual relations are considered low, vile, unworthy.
2. Fear of pregnancy.
3. Severe psychic trauma associated with sexual experience.
4. Childhood emotional fixation upon a member of the family.
5. An overwhelming homosexual component.
6. An extreme auto-erotic fixation.
7. Over-sublimation in art, literature or religion.
8. Venereal infection or fear of it.
9. Excessive transference of affection to children.
10. A defensive refusal to accept sexual submission.

Causes inherent in the attitude of the man:

1. A general failure to meet the romantic feminine ideal.
2. Failure to appreciate the importance of voluptuous preliminaries or ignorance of their technic.
3. Clumsy and inconsiderate first attempts at intromission.
4. Physical defects not apparent before marriage.
5. Unesthetic personal habits and coarse speech.
6. Too frequent relations: over-satiation.
7. Premature ejaculation or inability to restrain ejaculation until the woman is brought to orgasm.

Besides these there are surely other causes of frigidity, but these groupings omit only a few of all cases to be encountered. I shall say nothing of dyspareunia due to local inflammatory or neoplastic lesions since such cases are self-explanatory.

So great has been recent interest in endocrine glandular secretions affecting the sexual function that I must devote a few words to this subject. Especially should be mentioned the anterior pituitary sex hormone which has been described as the "universal sex hormone" because it has been found to induce rapid development of the sexual organs in immature laboratory animals of either sex. This hormonal preparation actually produces in senile animals a striking revival of sexual interest and activity. But in drawing conclusions from this phenomenon one should not forget that these animals have a very primitive sexual mechanism, involving little psychic conditioning. One should bear in mind that among lower animals, with their simple psychic life, deficient sexual responsiveness is virtually unknown except in the presence of senility. Among civilized peoples, however, there are many cases of unresponsiveness at the peak period of adult vigor. This is an anomaly in the biological world. The explanation is to be found not in endocrinology but in the anti-sexual and sexually perverting influences exerted by a man's moral ego, which is peculiarly a product of his civilization. The civilized human sexual expression is always highly and exactingly conditioned by the dictates of esthetic standards, moral principles and family associations. It is, therefore, in the psychic realm that one must look for an explanation of most of the sexual inadequacies found in persons who have not reached the senile period.

It seems entirely probable that throughout all ages of human life there exists a sexually significant endocrine variable. That this variable is, however, of no great importance is indicated both by analogy with animals and by the strikingly great success achieved by modern psychotherapeutic treatment of impotence and frigidity. Unquestionably there are rare cases in which the endocrine factor is highly important. Such unusual cases and all truly senile cases offer a legitimate field for endocrine therapy. At present our knowledge of the endocrine factor is very deficient and we have no practical means of administering our best endocrine products with continuous effectiveness. I look forward eagerly and hopefully to future assistance from the endocrinologists in dealing with certain phases of the broad problems of impotence and frigidity, but so long as we have a social order at all resembling that of the present day we shall be very foolish to expect the endocrinologists to extricate us from all the evil predicaments into which we are thrust by the ignorance, superstition and stupidity that so often dictate the management of our sexual lives.

I shall omit in the present discussion any extended reference to hereditary factors or to the supposed inherently weaker sexuality of women as contrasted with that of men. It must suffice to say that inherent sexual capacity varies just as does every other physiological capacity and that there is at least a superficial appearance of a weaker average sexuality among women than among men. This appearance of a weaker sexuality is, however, not so much an inherent characteristic as it is a result induced by the force of many adverse circumstances with which men do not have to contend.

At this point I wish to undertake some amplification of my outline of etiologic factors and while doing so to discuss, in most instances, specific prophylaxis and treatment.

The first factor I have mentioned on the woman's side is a strict romantic idealism in which virginal frigidity is glorified and sexual relations are considered vile and unworthy. It is my observation that this is the most fundamental cause of frigidity. The typical example is seen in the girl who has been shielded from a factual knowledge of the sexual life and whose idea of sexual expression has become fixed upon the physically de-sexed romance of innumerable popular novels. Such a girl is romantic enough, but her romanticism is of an artificial, unreal, ethereal kind that can not stoop to the practical adjustments of life. Her worst handicap is an impassable taboo barrier that leads her to shrink with aversion from the genital level of sexual expression. When such a feeling has been present through the formative years of childhood and early youth it is no simple matter to dispose of it even though adult intellectual perceptions demonstrate how unjustified and pernicious it really is. Consequently one often sees women who consider themselves intellectually emancipated from the sexual philosophy of their earlier lives yet who are so persistently bound by their habitual emotional reactions that responsiveness remains in abeyance. It is cheering to note that frigidity from this general cause is distinctly on the wane, for modern girls are tending to abandon a pride in virginal frigidity, replacing it by a salutary acknowledgment of their physical sexual feelings and a frank interest in every phase of the emotional life.

We shall live in a happier day when we can be fully rid of the notion that a woman must be sexually frigid to merit the moral title, "a good woman." Equally we shall have made progress when evidences of passion will not brand a woman as belonging to that class of "bad women" who, despite their "badness," have since early historical times continued to demonstrate man a hypocrite in his standards of womanly virtue.

In dealing with both impotence and frigidity I am often impressed by the appalling sexual disabilities to be laid at the door of our traditional moral code which frequently so throttles the normal sexuality of youth that it emerges into adulthood but a dwarfed, deformed, pitiful caricature of the beautiful emotional force that it should be. A full, normal love development and expression give to life the one satisfaction and meaning that is beyond all emotional questioning. Without it we are dangerously likely to see life lose meaning and to wander from the straight road of normal emotional expression into those unhappy by-ways which we designate as perversion or as psychoneurosis.

What I have been saying about impractical attitudes of mind as a cause of frigidity has been largely by way of prophylactic suggestion. Regretfully it must be admitted that the woman who reaches emotional maturity subject to powerful frigidity-inducing ideas sometimes has passed beyond curative treatment. The indicated remedy is to lend insight into her trouble and to hope that, with the best coöperation of the husband, she may gradually escape the malign influence of her former concepts. It is seldom an easy task, but is always worth attempting with younger women if the husband is fully coöperative. He must be willing to respect her romantic feelings, must have patience and must be able to display skill and judgment in the use of erotic stimulation.

With some of these frigid women who very earnestly love their husbands and who appreciate and regret their own sexual unresponsiveness it is desirable to extend such information as will enable them to simulate arousing and orgasm. The effort of simulation is little or no burden when it is prompted by affection, and under such circumstances it encourages the development of a genuine responsiveness. Some wives who have never known anything approaching vaginal orgasm are clever enough to give the husband a sense of complete response. These simulators report that their affectionate deception contributes measurably to their own happiness through the pleasure of adding to the husband's enjoyment. It is my impression that simulation may sometimes be a valuable aid, a significant factor in the promotion of marital happiness.

Some effort at simulation is likely to be of especial value during the early weeks of marriage when a combination of yet unsurmounted modesty barriers and physical dyspareunia imparts to many a bride frigid behavior which may become a fixed habit unless she consciously strives toward an understood pattern of normal responsiveness. It has long been recognized as a basic psychological principle that where the mind is receptive the simulation of emotion tends actually to produce it. Of course, it is highly requisite that there prevail a receptive or non-antagonistic attitude.

The ideal toward which each sexual partner should strive in intercourse is the simultaneous attainment of orgasm. Of all erotic stimuli none is so powerful as the sensing that one's sexual partner has been brought to an intense climax. To sense this achievement is to reach the loftiest peak of erotic satisfaction. It intensifies one's own response to an utter maximum. In a mutual responsiveness of this type lies the very essence of esthetic culture and unselfish idealism. It imparts the vital quality, the emotional hormone, of the civilized love life. In its presence marriage can scarcely fail to be happy; without it unhappiness is difficult to avoid. Of all objectives in married life none other is of such far-reaching importance to the harmony and happiness of the relationship.

Among the various causes of frigidity fear of pregnancy occupies a leading place. The bearing of this factor is so obvious as to call for little discussion, and for it we have an adequate and satisfactory remedy in effective contraceptive methods. Within the present century fear of pregnancy should cease to be rated as a common cause of frigidity. Nevertheless, at this time it ranks near the top of the list.

In considering psychic trauma associated with sexual experience as a factor in frigidity I have in mind chiefly rape or forced relations, painful first experience and terrifying childhood contacts with adult perverts. In any of these instances a barrier may be raised that can be broken down only by great patience and insight upon the part of the husband.

One of the fairly frequent and most effective causes of fridigity is found in childhood fixation upon a member of the family. Mother fixations are most common and most disastrous, for they lead not only to frigidity but to trouble at many other levels of the marital relationship. Family fixations are as a rule problems for the psychoanalyst, since the roots of the difficulty extend deeply into the earliest forgotten times of childhood. The fixation of a child's libido upon a member of the family may well be avoided, but there is demanded skilful management that is beyond the limitations of many parents. Among all the causes of frigidity this is certainly one of the fundamentally most baffling with which to deal, from the viewpoints of both prophylaxis and treatment.

The possession of an overwhelming homosexual component makes heterosexual adjustment difficult or impossible simply because the predominant emotional urge lies in another direction. It is well recognized that today homosexual practices among girls are very prevalent, due on the one hand to freedom of opportunity for such activities and on the other to barriers erected by convention against opportunities for heterosexual expression. Ordinarily, however, there does not result a sufficient degree of fixation appreciably to impair heterosexual adjustment. But when there is a strong fixation it may be very troublesome as a cause of heterosexual frigidity. Prophylactic efforts in this field are difficult to carry out, for even if young girls are told of the problem, their emotional needs may override their judgment. Nevertheless an understanding is helpful. The married woman with an overdeveloped homosexual component can be aided if her husband is sympathetic and if he will in the beginning modify his stimulation technic to simulate somewhat her homosexual experiences. Some cases are, in the absence of psychoanalytic aid, utterly beyond heterosexual adjustment, but these women often do not marry, deliberately choosing a homosexual life. To summarize the influence of homosexuality, I should say that in direct proportion to the strength of the homosexual component there is a weakening of the will to succeed at the heterosexual level. Nevertheless, it must not be thought that homosexual tendencies are incompatible with a good heterosexual adjustment, for well-defined bisexuality, or ability to respond strongly at either level, is by no means rare.

Many students of sexual problems have been inclined to assign auto-erotic practices as an important cause of frigidity and of impotence. With this view I most emphatically do not agree. It is true that there is a history of some masturbation in the lives of most of those who are impotent or frigid, but it is thoroughly unscientific from such evidence to blame the trouble upon masturbation. The histories of those who are very responsive and sexually active generally show far more masturbation than do the histories of impotent or frigid individuals. It has been contended that very long-continued masturbation of the clitoris renders normal vaginal response more difficult to acquire. Possibly there is some truth in this contention, but I am sure that it is over-emphasized. Clinical experience in premarital advice work has persuaded me that a certain amount of masturbation is not to be looked upon as an omen of frigidity but rather as an evidence of such an active eroticism as will better promise a normal responsiveness. When I find that a prospective bride or wife has practiced masturbation I encourage the man to learn her technic and to utilize it in building up her heterosexual response.

Over-sublimation of the emotions in art, literature or religion at times seems a factor strongly contributing to frigidity, although a deep interest in any of these directions is surely not incompatible with an intensely expressed sexual life. In many cases it would be more accurate to think of apparent over-sublimation as a result of frigidity rather than as a cause of it.

The rôle of venereal disease and of fear of venereal disease deserves some mention as a cause of frigidity. Certainly, a trying experience with venereal infection raises a barrier against full sexual expression, and harrowing or exaggerated stories of the effects of venereal disease sometimes have a similar effect. It is my experience that damaging fear of venereal disease is much less frequently encountered among women than among men, probably because the latter are more widely informed about it.

I have mentioned excessive transference of affection to children as a cause of frigidity. While this is unquestionably at times a directly contributing factor, it is in other instances, just as with over-sublimation, a symptom rather than a cause. The woman who is but feebly aroused by her husband naturally displays an excessive affection for her children as a compensation.

There are certain cases of frigidity in which a large factor appears to be a deep-seated resistance of the ego to the idea of entering into sexual relations with that complete surrender and abandon so characteristic of a full responsiveness. There is in these cases an unwillingness fully to accept the submissive rôle, a conscious or unconscious feeling that sexual abandonment and orgasm under male stimulation constitutes an act of weakness and defeat for the woman, of strength and victory for the man. Many psychoanalysts have given prominence to the so-called "battle of the sexes" as a primary cause of frigidity, but to me it appears that an antagonistic attitude is usually secondary to one or several of the causes previously mentioned. Yet it must be noted that there are wide variations in the degree of sexual antagonism which a given factor will arouse in different women.

Now I shall turn to a brief discussion of male behavior factors that have an etiologic relationship to frigidity. The most important of these is a general failure to meet the romantic feminine ideal. Just as I have criticized and condemned the impossible, unreal romanticism of many women as a factor in frigidity so would I indict the too commonplace, unromantic matter-of-factness of many husbands. Men and women are brought up with their ideals too far apart. Woman is to be highly emotional, very esthetic; man is to be stolid, undemonstrative, and is to feel a certain contempt for esthetics. It seems to have occurred to comparatively few people that the sexes would adapt better, find more in common, enjoy more mutual sympathy, stimulate each other more if they were taught alike about the same standards of emotional expression and restraint and the same esthetic ideals, while carefully preserving and accentuating all the truly basic and attractive sexual differences. Undeniably our present civilization is slowly bringing about such a condition in a thousand subtle ways. Almost everyone today is a feminist as judged by the standards of only a century ago. But there are yet many men whose lack of esthetic appreciation sets up barriers most destructive to even the very reasonable romantic expectation of a wife. So we find her drifting soon toward frigidity in her marital relations. When her romantic ideals have been thoroughly shattered over a period of years the prognosis is rather hopeless. Often her sexual interest will secretly have attached itself to some one other than the husband. If aid is sought early the outlook is much brighter. The husband must be made to visualize his deficiencies and must have instilled into him a real desire to alter some of his fundamental attitudes. This is seldom an easy accomplishment, but a patient attempt is sometimes rewarded by very great success.

Failure of the husband to appreciate the importance of voluptuous preliminaries, or ignorance of their technic, contributes largely to frigid behavior by the wife. Very broadly speaking, it seems to be characteristic of men to rush rapidly to intromission, while women, in an equally characteristic manner, prefer to linger over the preliminaries. Naturally these two tendencies clash, and the inconsiderate man may soon have a frigid wife for his lack of consideration. Again many men who wish to be considerate are incredibly unimaginative and barren of erotic technic. Such men should seek advice from an informed and sympathetically inclined physician. While it is not my intent to digress here upon the art of love I would emphasize that it is in truth capable of being made a very beautiful art whose central theme must ever be the bringing of a maximum of happiness to one's sexual partner. And facility at this art is man's best defense against unresponsiveness in his wife.

The matter of clumsy and inconsiderate first attempts at intromission is so important as to deserve special mention. Difficulty from this source is commonly a product of ignorance rather than of lack of consideration. I find no complaint in this regard among persons carefully instructed before marriage. In this observation is found the answer to the problem.

A frigid reaction is sometimes induced by the presence of certain repulsive physical defects not apparent before marriage. Among the common ones are large hernia or hydrocele and extensive skin diseases. Such conditions should, of course, be remedied prior to marriage.

Unesthetic personal habits and coarsely worded references to sexual relations often initiate frigidity. All that I wish to say upon this subject is that it is difficult to control, depending as it does largely upon the background that has contributed to the husband's esthetic standards. It should always be a matter for special mention in premarital advice.

Over-satiation from too frequent relations is sometimes complained of as a cause of frigidity. This occurs where the wife has a low capacity for relations and the husband a high one. The remedy lies in efforts upon each side to meet the other halfway in an acceptable compromise and sometimes in the palliative employment of manual stimulation. Every effort should be made to increase the responsiveness of the wife. It is psychologically sounder to do this rather than to concentrate upon an effort to dampen the husband's ardor. In some instances the erotic incompatibility is too great for any tolerable adjustment and there arises a choice between divorce and a life of emotional thwarting and misery.

Few persons appreciate the important part played by premature or very rapidly reached ejaculation in inducing frigidity. When the husband experiences ejaculation and loses erection long before his wife can attain orgasm she is sure in time to become so dissatisfied with his behavior as to be unresponsive toward him. In this situation the man must receive skilled advice as to his trouble, and the wife must be taught to coöperate with him in seeking improvement. In the treatment of impotence and premature ejaculation it is frequently observed that recovery is enormously facilitated by the coöperative efforts of a sympathetic woman of real understanding of the sexual life.

At this point I shall close the elaboration of my outline of causes behind the phenomenon of frigidity. I am conscious that much of importance has been left unsaid, but I am hopeful that what I have presented will lend a fairly adequate insight into the general problem. As one surveys the material that has been reviewed the thought occurs that in the face of such multiple adversities the truly passionate woman with full normal sexual expression must be a comparative rarity. Actually such is the case. The truth is, that a vast majority of both men and women of our civilization are sexual malcontents, faltering and groping through life in search of a happiness that is largely denied, either because of the impossible, unnatural character of their ideals, or because of the cruel stupidities of social custom and taboo. For this unhappy condition there appears to be no panacea. Improvement must come through a painfully slow evolutionary process in the course of which many errors are inevitable. The one principle of most value is the maintenance of an earnest, tolerant, humanitarian attitude, free from essential addiction to religious or moral dogma. The science of sexual and emotional adjustment is but in its infancy, yet there is cause for encouragement in that it is really emerging as a science, a science whose contribution to human happiness is already considerable. In the spirit of this science I hope that my remarks have created no offense and that somewhere among them there may be found material which will render valuable clinical service.

DISCUSSION

Dr. Kate B. Karpeles: I was very pleased when Dr. Stokes asked me to discuss this paper from the standpoint of the general practitioner. I think it probable that this problem is one that is brought to the family physician before anyone else, and I feel that he fails most lamentably if he is unprepared to deal with it seriously and competently. Dr. Stokes has covered the field so thoroughly, and I find myself so much in agreement with him that I have very little to add. There are one or two practical points that may, perhaps, be emphasized to advantage. A condition with which I have been several times confronted has been that of a timid young woman, fearful of physical pain, who had never been able to submit to a consummation of marriage. This is a situation that must be handled with great tact and kindness if she is to be helped in the establishment of a normal sex life. Sometimes, by careful and sympathetic advice, she can be educated to a more courageous attitude. This is, of course, by far the most desirable solution to be obtained. Several times, however, I have found it necessary to give such a patient a light anesthetic and rupture the hymen manually. Dr. Stokes has touched in his paper on the advantages of our increasing knowledge of contraception. Unfortunately there prevails an unenlightened attitude on this subject on the part of a large and influential portion of our population, including, I am sorry to say, the American Medical Association. Our present antiquated laws so hamper work in this field that the proper technic of contraception is available to comparatively few. I should like to see this Society take the lead in bringing about a change in the position of the American Medical Association toward this question. With regard to the recently discovered, powerful sex hormone mentioned by Dr. Stokes, its use should be tempered with extreme caution. If, as is usually the case, a patient's frigidity is the result of powerful mental conflicts, artificially forcing a great increase of physical urge upon her will only intensify those conflicts and may precipitate nervous and mental disaster.

Dr. E. W. Titus: Dr. Stokes has given us an excellent discussion of a very interesting subject, the importance and frequency of which is well known to those of us engaged in gynecological work. My remarks will be confined to the gynecological aspect of this subject. Dr. Stokes has pointed out that the causes of frigidity in women may be either physical or psychic. Of the physical causes dyspareunia heads the list. Inflammations, developmental anomalies and new growths, chiefly being responsible. Of the developmental conditions, narrowing of the introitus, rigid resistant hymen and retro-displacements are important. It is not an unusual experience to be consulted by a woman with a rigid unruptured hymen, who has been married for months or even years. Vaginismus, which may be termed pseudo, is seen frequently in the bride. True vaginismus is always psychic and lesions are not to be found. In the majority of instances we must rely on the psychotherapeutist for cure. Fear of pregnancy plays an important rôle in frigidity and, contrary to lay opinion, fertility is of an average normal. Dr. Stokes deserves a great deal of credit for the work he is doing in sex problems, and I feel very fortunate in having one of his capability to call upon for aid in solving such problems.

Further discussion participated in by **Dr. Arthur MacDonald.**

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
COURSEN B. CONKLIN, A.M., M.D., *Managing Editor*
WALLACE M. YATER, A.B., M.D., M.S., *Editor*

Committee on Publication
WALLACE M. YATER, A.B., M.D., M.S., Chairman
JAMES W. ESLER, A.B., M.D. C. R. L. HALLEY, A.B., M.D.
F. R. SANDERSON, M.S., M.D. MATTHEW WHITE PERRY, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

FREE MEDICAL SERVICE IN WASHINGTON

The amount of free medical service rendered in Washington is difficult to estimate accurately. Even after adding the number of examinations and treatments given in all of the free clinics and charity wards of the hospitals there would still remain an inestimable figure representing the amount of service performed free either voluntarily or because of uncollectible bills by physicians in their private practice. Some idea of the vast amount of charity work performed may be derived from a brief survey of the professional service rendered in the Gallinger Municipal Hospital alone during the fiscal year ended June 30, 1933. In that year there were 17,558 new cases in the institution, 1,938 infants were born and 4,299 surgical operations were performed. A total of 5,631 visits were made by the visiting staff, or an average of 15.5 visits each day. This figure does not include visits made by the chief of staff, heads of departments and consultants in various specialties, which would bring the number up several hundreds, perhaps a thousand higher. As a rough approximation of the number of total visits made by all members of the visiting staff the figure might be set at 6,500. This would bring the average number of daily visits up to 17.8. Assuming that at each visit only 20 patients were seen professionally by each man, a figure undoubtedly too small, and charging two dollars for each visit to each patient, the total cost of visits would amount to $260,000. Add to that the modest fee of $25.00 for each obstetrical delivery and for each surgical operation, and the total figure for professional service rendered at the municipal hospital would come to $415,925 during one year. This amount of service is donated to the Government of the District of Columbia by local members of the medical profession.

As an indication of the great increase in the amount of free medical service in recent years, it may be stated that the averge number of patients treated continuously at the municipal hospital during the past year was nearly 4 times as great as the number cared for 10 years before or in 1923, and twice as great as the number of persons furnished assistance in 1929. The number of beds occupied at times has been greatly in excess of the number for which the hospital was designed. Also, it has been impossible to enlarge the resident staff and the visiting staff proportionately to the increase in amount of service necessary. Consequently, the members of the visiting staff have been called upon to perform more and more work under adverse conditions. A certain amount of dissatisfaction has recently been voiced by many members of the visiting staff, indicating that they are not able to perform their work efficiently because of the crowding of patients and the insufficient number of resident physicians, interns and nurses.

It can probably be said without fear of contradiction that the visiting staff of the Gallinger Municipal Hospital is as capable as that of any municipal hospital in the country, comprising as it does more than a hundred of Washington's best physicians. It is a matter of professional pride to these men that the reputation of the hospital which they serve should be above reproach. It is also safe to say that the reputation of no hospital can be excellent when there is overcrowding of patients, an insufficient number of nurses and too few residents and interns. If capable physicians are willing to donate their time and talents they should be given a chance to make the reputation of the institution which they serve worthy of their ambitions. It behooves Congress, therefore, to do one of two things—either to limit the number of patients admitted to the Gallinger Municipal Hospital to conform to the capacity of the institution, or to enlarge the capacity and to increase sufficiently the number of nurses, residents, interns and other personnel. The latter would certainly be the more charitable course and at the same time it would show some appreciation for the excellent medical service rendered indigent patients of Washington gratis. This editorial would not be complete without a word of praise for the very efficient superintendent of the municipal hospital, Dr. Edgar A. Bocock, whose tireless efforts have made it possible to care for an excessive number of patients under adverse conditions.

COMMITTEE ON MEDICAL ECONOMICS

Under the chairmanship of Dr. Thomas A. Groover, on the evening of October 30, with 29 of the 35 members present, the following organization was effected:*

H. H. Schoenfeld, *Vice Chairman* (*Appointed*).
Marvin McD. McLean, *Secretary* (*Elected*).

Personnel of subcommittees:

Hospitals and Dispensaries
(*Subcommittee No. 1*)

Henry C. Macatee, *Chairman*
J. Russell Verbrycke, Jr.
Joseph Horgan
Gregg C. Birdsall
Marvin McD. McLean
Jesse T. Mann
William H. Jenkins
Kate B. Karpeles
Janvier W. Lindsay
Edgar M. McPeak

Contract Practice
(*Subcommittee No. 2*)

James A. Gannon, *Chairman*
Daniel L. Borden
Horatio N. Dorman
H. H. Schoenfeld
Joseph P. Shearer
William J. Stanton

Workmen's Compensation and Industrial Medicine
(*Subcommittee No. 3*)

John A. Talbot, *Chairman*
Arch L. Riddick
J. Chester Brady
Edward Clarke Morse
Francis X. McGovern
Terrell Moody
Robert J. Bosworth

Government and Public Health Agencies
(*Subcommittee No. 4*)

Oscar B. Hunter, *Chairman*
Charles Stanley White
Norvell Belt
Jacob Kotz
Preston A. McLendon
William M. Ballinger

Coördination of Medical Resources
(*Subcommittee No. 5*)

Joseph S. Wall, *Chairman*
John D. Thomas
Harry H. Kerr
Alec A. Preece
William H. Hough

Matters pertinent to the function of the respective subcommittees will be referred to them for investigation and report.

The Committee on Medical Economics will meet regularly on the second and fourth Tuesdays of each month at 8:30 p.m.

Resolutions showing the attitude of local professional groups toward the Medical Society's activities in the field of medical economics:

Resolved, That the Washington Medical and Surgical Society shall go on record as heartily in accord with the purpose and action of the Medical Society of the District of Columbia, its officers, and committees, in its efforts to maintain the high standards of medical ethics and practice and its work to combat the exploitation of its members; and be it

Further Resolved, That a copy of this resolution be transmitted to the Medical Society of the District of Columbia.

Resolved, That the Section on Internal Medicine, in regular meeting assembled, heartily and enthusiastically indorses the work of the Committee on Medical Economics and hopes that the said committee will speedily report to the Society a comprehensive and workable plan to relieve the distressing and chaotic conditions existing at present in the practice of medicine in the District of Columbia.

---

* Reported to Society, November 1, 1933.

TRANSACTIONS OF THE SOCIETY*

Stated Meeting, November 1, 1933

The following were duly elected to membership:

Active Members

Weston Bruner, Jr., 1650 Harvard Street, N.W.
Charles Troll Carroll, 6801 Sixth Street, N.W.
Edgar Leonard Goodman, 1518 Allison Street, N.W.
Edward Jacob Grass, 3700 Massachusetts Avenue, N.W.
John U. Schwarzmann, 1756 N Street, N.W.

Associate Members

Nancy DuVal Campbell, St. Elizabeth's Hospital
Raymond Osborne Dart, Army Medical Museum
Oswald Fenton Hedley, National Institute of Health
Cecil V. King, Gallinger Municipal Hospital

Applicants for membership to be voted on in January, 1934:

For Active Membership

Elma Bebee Carr, George Washington University—1928
J. Lloyd Collins, University of Kansas—1928
Bernard J. Gurwin, George Washington University—1926
Robert E. Henderson, Hahnemann Medical College—1917
Jerome John Krick, Georgetown University—1930
Emmett H. Markwood, Georgetown University—1931
Wilbur Wynn Martin, George Washington University—1931
William Albert Ryon, George Washington University—1928
Saul Schwartzbach, University of Maryland—1929
Erwin Steinman, George Washington University—1932
Howard Hamilton Strine, Georgetown University—1928
Stephen Alloysius Yesko, Georgetown University—1922

For Associate Membership

James Edwin Houghton, George Washington University —1917
Felipe Andres Martinez, Georgetown University—1932

For Reinstatement to Active Membership

Herbert P. Ramsey, 1835 Eye Street, N.W.

The following proposed amendments to Article VII of the Constitution, changing the name and number of members of the Committee on Civic Health, were adopted:

1. Section 1: Change the second last word "Civic" to "Public."
2. Section 2: In the sixth line change the word "Civic" to "Public."
3. Section 3: Strike out the first sentence and substitute the following:

> "The Committee of Censors, Committee on Publication, Committee on Public Information, House Committee, shall consist of five members each; the Committee on Public Health shall have a membership of seventeen. Members of these committees shall be appointed by the President at the time of his assumption of office, to serve until their successors are appointed."

4. Section 9: In line one, change the word "Civic" to "Public."

> At the end of the first paragraph add—
>
> "It shall maintain subcommittees on communicable diseases, on tuberculosis, on venereal diseases, and on public sanitation, and shall appoint such other subcommittees from time to time as may be expedient to perform special duties as they may arise."
>
> In the second paragraph strike out the words after the word "President," and substitute the phrase, "and shall consist of seventeen members."

ACTIVITIES, MEDICAL SOCIETIES WITH LIMITED MEMBERSHIP

Washington Medical and Surgical Society

The first meeting of the Washington Medical and Surgical Society for the year 1933–34 was held at the University Club. Dr. Noble P. Barnes was host to the Society at dinner.

Presidential Address, "The Treatment of Ocular Injuries." J. Beaty Griffith, M.D.

Case Reports: Drs. Thomas C. Thompson and J. Duerson Stout.

On November 27, 1933, Dr. Boyce R. Bolton will be host; the essayist of the evening, Dr. E. G. Breeding. Case reports are to be presented by Drs. Albert P. Tibbets and Noble P. Barnes.

Medical Arts Society

The first regular fall meeting was held at the Hamilton Hotel, Thursday, October 12, 1933. The program:

1. "The use of Insulin in Malnutrition." H. Lynn Colvin, M.D.

   The essayist cited the work of other investigators and presented his results in 5 cases of men and women definitely underweight who showed marked improvement of nutrition under this régime.

Discussion by John A. Reed, M.D., an invited guest.

---

* For complete list of Society's officers and committee personnel see page v.

2. "Congenital Hemangioma in a Girl of Three and One-half Years of Age." Tomas Cajigas, M.D.
   The tumor was benign but involved both ovaries, tubes and uterus, necessitating complete removal. The patient was present and appeared in excellent health.

Discussion: Drs. C. J. Bowne, J. P. Shearer, P. A. McLendon, and Major R. O. Dart, guests of the Society.

PAN-AMERICAN MEDICAL ASSOCIATION

The Washington, D. C., Chapter of the Pan-American Medical Association resumed its winter sessions on November 10, 1933, with a meeting dedicated to the memory of the great Latin-American physician-statesman Hipólito Unanue (1755–1833). Unanue, one of the outstanding men of his generation, made his mark in a number of sciences and also in public life. Several aspects of his career were emphasized. In addition to the address of the evening by His Excellency the Ambassador Sr. Dr. Manuel de Freyre y Santander, who had most kindly extended to the Chapter the privilege of meeting in the Embassy of Peru, Dr. E. Gil Borges, Assistant Director of the Pan-American Union, Dr. Prentiss Willson, President of the Medical Society of the District of Columbia, and Dr. George B. Trible, President of the International Medical Club, were heard. In the absence of the President of the Chapter, Surgeon General H. S. Cumming, now in Europe, the Vice-President, Dr. J. G. Lewis, presided. Dr. A. A. Moll is the Secretary.

The membership is purposely limited to about 30, and includes some of the most prominent members of the profession in the city, and especially those interested in bringing about closer relations among physicians in the different republics in the western continent. The diplomatic corps of Latin-America in Washington includes at present 2 physicians, Dr. M. Paz Baraona, the Minister of Honduras and former president of his country, and Dr. Henri Debayle, the Charge d'Affaires of Nicaragua. Other men occupying similar posts in the recent past and remembered with pleasure in Washington are Dr. J. M. Puig Casauranc of Mexico, Dr. J. B. Sacasa and Dr. Luis M. Debayle of Nicaragua, Dr. Carlos Leiva of Salvador, and Dr. E. Argueta of Guatemala.

The next meeting of the Pan-American Medical Association will be held about December 3, probably in the Cuban Embassy. It will be devoted to honor the memory of Dr. Carlos Finlay, born December 3, 1833, whose theory of the rôle of the mosquito in the spread of yellow fever has proved a boon to mankind.

The Association held its last meeting of the previous session in June in the Legation of Nicaragua. Dr. Ortiz Tirado of Mexico, was the guest of the occasion. Papers were read on that evening by Drs. Henri Debayle, Charles Stanley White and Custis Lee Hall of this city, Drs. Dean Lewis and Fielding H. Garrison of Baltimore, and Prof. Alessandri of Rome.

FAIRFAX COUNTY MEDICAL SOCIETY

The Fairfax County Medical Society held its quarterly meeting at the Racquet Club on November 2, 1933, at 11:30 A.M., with Dr. George B. Trible as host. The program.:

1. "Some Diagnostic Features of Scarlet Fever." H. C. Macatee, M.D.
2. "Urticaria. Case Report." B. F. Phillips, M.D., of Quantico.

Approximately 25 attended, including Drs. E. S. Waring of Fairfax, W. P. Caton of Accotink, F. M. Brooks of Fairfax Station, William Meyer of Herndon, C. L. Starkweather of Occoquan, Lyle M. Mason, H. H. Schoenfeld, and Thomas A. Poole of Washington. Dr. A. L. Carson, Jr., Fairfax, Va., is the Society's Secretary.

SMITH-REED-RUSSELL SOCIETY

The annual banquet of this undergraduate honor society of George Washington University was held at the University Club on October 20. An address was delivered by Dr. William Charles White, Chairman of the Committee on Research of the National Tuberculosis Association. Dr. E. B. Vedder presented an interesting survey of the accomplishments of Dr. Theobald Smith, Dr. Walter Reed and General Frederick F. Russell, ending with a strong plea to the student body to emulate the spirit of research manifested by these men all of whom were former members of the faculty. Certain students who had gained the required scholastic rating were inducted as members.

NEWS, MEDICAL SERVICES, UNITED STATES GOVERNMENT

Association of Military Surgeons of the United States

At the annual meeting of the Association of Military Surgeons of the United States, held in Chicago, Major General Harry L. Gilchrist, United States Army, was elected President, assuming office January 16, 1934, the day of his retirement from active service. General Gilchrist, who has just completed his service as Chief of the Chemical Warfare Service of the Army, is a medical officer of long and distinguished career. Other officers elected were: 1st Vice President, Lieutenant Commander William Seaman Bainbridge, U. S. Naval Reserve of New York; 2nd Vice President, Medical Director Charles M. Griffith of the United States Veteran's Administration; 3rd Vice President, Rear Admiral Percival Rossiter, Surgeon General of the Navy; 4th Vice President, Colonel Arthur E. Lord, Surgeon General of the Illinois National Guard; 5th Vice President, Assistant Surgeon General C. E. Waller, United States Public Health Service; Secretary and Editor of "The Military Surgeon," Brigadier General Jefferson R. Kean, U. S. Army retired. The meeting was attended by medical officers of all United States Services, and by a number of delegates from the Armies and Navies of other countries.

Wellcome Prize and Medal

The Wellcome Prize, consisting of $500 and a gold medal, was for 1933 awarded to Major Edgar Erskine Hume, Medical Corps, U. S. Army, Librarian of the Army Medical Library, for his essay, "The Value of Studies in Health and Sanitation in War Planning." The Wellcome Prize was established in 1916 by Sir Henry S. Wellcome of London, and is awarded annually by a board of judges appointed by the Association of Military Surgeons. Honorable mention, which includes life membership in the Association, was awarded to Lieutenant Colonel Paul W. Gibson of the Army War College.

Dr. Dean Lewis Addresses Meeting

Army Medical Center

On November 20, 1933, Dr. Dean Lewis, President of the American Medical Association addressed a well-attended meeting of commissioned officers (active, reserve and retired) of the Medical Departments of the Army, Navy, Public Health Service and Veterans' Administration. Subject: "Diagnostic Failures and Their Lessons." A two-reel sound motion picture, "Good Hospital Care," was shown. A buffet supper followed. These meeting are held monthly.

WOMAN'S AUXILIARY ACTIVITIES

The activities of the Woman's Auxiliary to the Medical Society of the District of Columbia are manifold; in addition to general relief work, such as the filling of Christmas stockings, many Red Cross supplies are being made for the local hospitals. Recent programs:

October 4: Mrs. C. W. Culver read a paper, "A review of the Auxiliary's activities since its inception, October, 1925, with a report of the work of the National Woman's Auxiliary."

November 1: Miss Betty Wright, Executive Secretary of the National Association of Organizations for the Hard of Hearing, presented "Some remarks on the work of the Association for the Hard of Hearing, with a review of the accomplishments of Lip-reading Classes."

December 6: An event of much interest will be the supplying of a buffet supper and entertainment to the membership of the Medical Society of the District of Columbia after the business meeting, December 6. The George Washington University Glee Club will furnish a musical program.

The plans for the raising of funds for necessary expenditures for the winter months include afternoon card parties and a sale of paper products.

BOOK NOTICE

The Diseases of Infants and Children, by J. P. Crozer Griffith, M.D., and A. Graeme Mitchell, M.D. Philadelphia: W. B. Saunders Company, 1933. 1155 pages, illustrated. Price $10.00.

The authors have compiled in one volume a comprehensive up-to-the-minute text. Not only the older established facts but the latest papers dealing with pediatric subjects have been carefully culled. The appended extensive bibliography shows a keen appreciation by the authors of true values. The modern advances in feeding based on vitamin content are well depicted. Many of the newer procedures such as transfusions are given with clear definite directions. Many parts of Griffith's two-volume book have been completely re-written. The excellent illustrations, however, with typical case reports of various diseases have been retained and many plates added. Tables are newly supplied, notably a compilation of the norms iy complete blood chemistry in infancy; also a differentiation of blood dyscrasias affecting the spleen. This book, from the practicality of its teaching and completeness, should have a special appeal to the general practitioner.

THE OLD OAKEN BUCKET*

(Revised and edited by a "Sanitarian")

With what anguish of mind I remember my childhood,
Recalled in the light of a knowledge since gained;
The malarious farm, the wet fungus grown wildwood,
The chills then contracted, that since have remained.
The scum covered duck pond, the pigsty close by it,
The ditch where the sour smelling house drainage fell;
The damp shaded dwelling, the foul barnyard by it,
But worse than all else, was that terrible well;
The old oaken bucket, the mold crusted bucket,
The moss covered bucket, that hung in the well.

Just think of it! Moss on the vessel that lifted
The water I drank in days called to mind,
Ere I knew what professors and scientists gifted,
In the waters of wells by analysis find.
The rotting wood fibre, the oxide of iron,
The algae, the frog of unusual size;
The waters, impure as the verses of Byron,
Are things I remember with tears in my eyes.

And to tell the sad truth—though I shudder to think it,
I considered that water uncommonly clear;
And often at noon, when I went there to drink it,
I enjoyed it as much as I now enjoy beer.
How ardent I seized it, with hands that were grimy;
And quick to the mud covered bottom it fell;
Then reeking with nitrites and nitrates, and slimy,
With matter organic, it rose from the well.

Oh! Had I but realized in time to avoid them,
The dangers that lurked in that pestilent draught;
I'd have tested for organic germs, and destroyed them,
With potassium permanganate ere I had quaffed.
Or, perchance I'd have boiled it, and afterward strained it,
Through filters of charcoal and gravel combined;
Or after distilling, condensed and regained it,
In potable form, with it's filth left behind.

How little I knew of the dread typhoid fever,
Which lurked in the water I ventured to drink;
But since I've become a devoted believer,
In the teachings of science, I shudder to think.
And now, far from the scenes I'm describing,
The story for warning to others I tell;
As memory reverts to my youthful imbibing,
And I gag at the thought of that horrible well;
And the old oaken bucket, the fungus grown bucket,
In fact, the slop bucket, that hung in the well.

—J. C. Bayles

(Reprinted from "The Doctor's Window," by Ina Russelle Warren, 1897.)

---

* As selected by J. H. Trinder, M.D.

Medical Service in Physiotherapy

PHYSIOTHERAPY ASSOCIATION
PT

MARY LEE CASTLEMAN
620 Washington Medical Building
1801 Eye Street, N. W.
NAtional 7200

Massage—Baking—Diathermy—Colonic Irrigation
(Available for Physicians in the Care of Their Patients)

MAXWELL
AND
TENNYSON

Pharmacists
Specializing in ℞ work and office supplies

Washington Medical Building
1801 Eye Street, N. W.
Na. 0525

Columbia Medical Building
1835 Eye Street, N. W.
Di. 9576

1726 Eye St., N. W.
Na. 9397

PSYLLIUM SEED CONCENTRATE

The jelly-forming substance of psyllium seed.

Advantages

1. No danger of impaction.
2. Low cost.
3. Small dose.
4. Easily taken.
5. Wonderfully effective.

Dose: A slightly rounding teaspoonful in half a tumbler of water after each meal.
Price: 75¢ per pound.

NATIONAL VACCINE AND ANTITOXIN INSTITUTE
1515 U Street, N. W., Washington, D. C.
Phone: NORTH 0089

CONTAGIOUS DISEASE REPORT

September, 1933

Health Department, District of Columbia

	Morbidity	Mortality
Typhoid fever	17	1
Typhus fever	0	0
Smallpox	0	0
Measles	7	1
Scarlet fever	30	0
Whooping cough	25	0
Diphtheria	35	1
Influenza	0	0
Poliomyelitis	5	1
Encephalitis-Lethargica	1	0
Epidemic Cerebrospinal Meningitis	1	1
Tuberculosis (all forms)	68	44
Syphilis	441	3
Gonorrhea	282	0
Chickenpox	1	0
Chancroid	6	0
Pellagra	0	0
Pneumonia (all forms)	42	18

TRUTH ABOUT MEDICINES

Propaganda for Reform

Intravenous Use of Barbital Compounds (II).—The Council on Pharmacy and Chemistry reports that in 1931 it decided on definite limitations for the intravenous use of barbital compounds for induction of anesthesia and sponsored the following statement: "Their intravenous use should be limited for the present to conditions in which oral administration is not feasible either because the patient is unconscious, as in cerebral hemorrhage, eclampsia, or status epilepticus, or because he resists, as in delirium, or because a very prompt action is imperative, as in convulsion from local anesthesia." In the consideration of sodium amytal and the brands of pentobarbital sodium, the Council recognized that these drugs might be administered intravenously in the conditions mentioned in its report and laid down certain stipulations with regard to propaganda for their intravenous use. In the recent consideration of Pernoston, a barbituric acid derivative marketed only in injectable form, the question was raised as to whether or not in the light of accumulated experience it was desirable to relax the limitations which the Council had placed on the intravenous use of barbital compounds. A questionnaire was sent to a selected list of surgeons, anesthetists and others asking whether they considered that the time had arrived when the Council should agree to the advertising of preparations of soluble barbiturates for intravenous injection for induction of anesthesia. The Council has given careful consideration to the replies to the questionnaire, and it believes that the evidence overwhelmingly sustains its previous conclusion concerning the limitations for the use of the soluble barbiturates in the induction of anesthesia. The Council, therefore, has reaffirmed its previous decision with reference to the advertising of these substances. (J. A. M. A., July 15, 1933, p. 208)

Addition of Phenolphthalein, Acetylsalicylic Acid (Aspirin) and Other Drugs to Chewing Gum, Candy and Food Articles.—The Committee on Foods reports that medicating common food articles with drugs—such as to the addition of phenolphthalein to chewing gum, acetylsalicylic acid (aspirin) to candy, and senna to bread—tends to promote indiscriminate self-medication and is to be unqualifiedly condemned as a menace to public health. The preparation of medicines with confections, such as sugar or chocolate, as a device for making unpalatable drugs more acceptable is quite a different matter from the addition of drugs to articles of foods that are bought by the public without restriction. This ruling, therefore, has no reference to so-called candy medications prescribed by a physician and taken under his directions. (J.A.M.A., July 22, 1933, p. 281)

KLOMAN INSTRUMENT COMPANY

911 19th Street, N. W.
Washington, D. C.

A complete service for the convenience of the medical profession and their patients.

Comfort and the necessities of every description for the sick room.

They maintain a high class fitting room for surgical belts, maternity belts, trusses, elastic stockings, etc.

Use "KLODENT" Tooth Paste—the finest made—fifteen cents (15¢) per tube. Buy a dozen at $1.50.

Trademark Registered **STORM** Trademark Registered

Binder and Abdominal Supporter

gives perfect uplift and is worn with comfort and satisfaction. Made of Cotton, Linen or Silk. Washable as underwear. There are three distinct types and many variations of each type.

Picture Shows "Type N"

FOR PTOSIS, HERNIA, PREGNANCY, OBESITY, SACRO-ILIAC RELAXATIONS, HIGH AND LOW OPERATIONS, ETC.

Each Belt Made to Order *Ask for Literature*

KATHERINE L. STORM, M.D.

Originator, Owner and Maker

1701 DIAMOND ST. PHILADELPHIA

MEDICAL ANNALS

of the

DISTRICT OF COLUMBIA

VOLUME II DECEMBER, 1933 NUMBER 12

THOROTRAST ENCEPHALOGRAPHY BY CISTERNA PUNCTURE

A PRELIMINARY REPORT OF EXPERIMENTAL STUDIES

F. O. COE, M.D.
Professor of Radiology,
L. S. OTELL, M.D.
Clinical Professor of Radiology,
Georgetown University School of Medicine

AND

O. F. HEDLEY, M.D.
Passed Assistant Surgeon,
United States Public Health Service

Since the work of Dandy in 1918, the literature has contained numerous references to encephalography and ventriculography, based on the injection of air or some other inert gas.

In this article consideration is given the use of a new medium. It is not to be inferred that the use of gaseous substances are not regarded as of proved value, although their usefulness in the visualization of the subarachnoid spaces is decidedly limited. We believe that an opaque medium miscible with rather than replacing the cerebrospinal fluid would reach parts of these spaces and the cerebral ventricles not generally demonstrable by the use of air and other gases. Furthermore, such a medium would allow radiographic demonstration in a more nearly unaltered state.

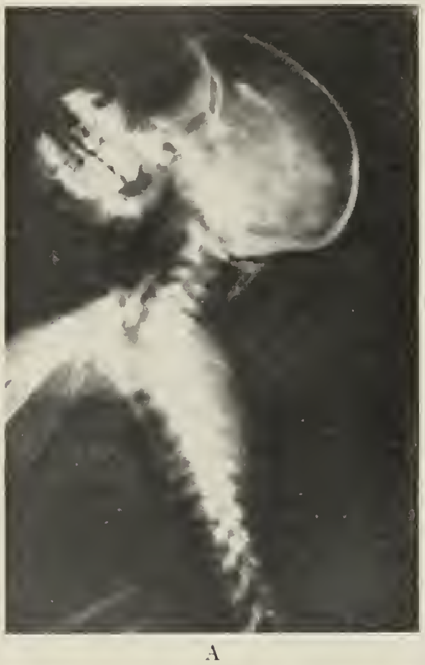
An ideal medium for this purpose should be (1) nontoxic, (2) nonirritating (immediately or remotely), (3) of sufficient atomic weight to cast a shadow denser than that of the bony framework, (4) miscible with the spinal fluid, and (5) readily eliminated.

With the above in view, an iodine salt (neoskiodan) and a thorium colloid (thorotrast) were employed. The former drug, used successfully in intravenous urography, was injected into the suboccipital spaces of 2 anesthetized monkeys. In neither instance could we successfully visualize the subarachnoid spaces.

Thorotrast is a stabilized colloid of thorium dioxide diluted with an aqueous glucose solution and made isotonic with the blood serum and other body fluids. It was first used in animals and humans by Radt and by Oka at the Univeristy of Berlin for visualization of the liver and spleen. Since then it has been used successfully in arteriography, veinography, pyelography, placentography, hysterography, cystoureteropyelography, and in the visualization of sinus tracts and fistulae. Its use in hepatosplenography has been somewhat limited in this country because of the failure of acceptance by the Council on Pharmacy and Chemistry of the American Medical Association. This rejection was based mainly on the grounds of possible harmful remote effects. Radt's series of cases injected 5 years ago and the series of 100 cases reported by Yater and Otell, the first of which were injected 3 years ago, have shown no evidence of after effects. It is not believed, therefore, that the much smaller amount used in encephalography is sufficient to produce damage to the other parts of the body.

To test the practicability of its use, a number of adult Macaca rhesus monkeys weighing about 3 kilograms were used. These animals were completely anesthetized with sodium amytal administered intravenously. Approximately 0.03 gm. of the drug per liter of body weight was found to be the optimum amount.

A series of 4 monkeys was first used. Cisterna punctures were performed and 2 cc. of cerebrospinal fluid removed. Six cc. of thorotrast were then slowly injected under fluoroscopic control. It was possible to observe the medium pass downward around the spinal cord and upward at the same time as a diffuse opacity at the base of the brain. Later, dense lines following the pattern of the cerebral sulci were noted. In 1 instance, only the cerebral ventricles were visualized and in another both ventricles and cerebral sulci were seen (figure 1, A and B). Radiograms taken immediately afterward confirmed the fluoroscopic observations. The sulci, with the exception mentioned, were seen as dense opaque lines, and the convolutions, in contrast, were evident as dark radiolucent areas. The position and size of the convolutions were quite apparent. The outlines of the ventricles, when demonstrable, were more clearly defined and showed greater contrast than when air is used. Films taken 30 minutes after injection showed more extensive visualization of the sulci.



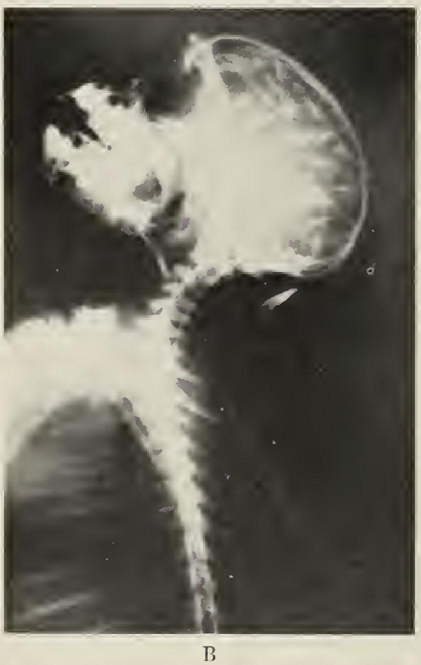


Fig. 1. (A) Shows Outline of Cerebral Ventricles. (B) Shows Sulci and Convolutions.

Three of the 4 monkeys died within 24 hours. The fourth was killed shortly after injection because of a condition not associated with this experiment. It is felt that the cause of death in these 3 animals was due to faulty technic. The animals were more heavily anesthetized than was found necessary in later experiments. Furthermore, while only 2 cc. of cerebrospinal fluid was removed, 6 cc. of the medium was injected. Necropsies were performed in each instance. In 1 there was evidence of increased tension, and in another an extensive hemorrhage was noted in the region of the pons, suggestive of trauma from the needle. This animal became spastic and died during the injection.

Five more monkeys were then used. Two cc. of cerebrospinal fluid were removed and only 2 cc. of thorotrast injected. The injections were observed fluoroscopically as before and films were taken immediately and 30 minutes afterward. The appearance of the radiographs was similar to those described in the first group except for possibly not quite as wide distribution of the medium over the surface of the brain. At the end of a week much of the thorotrast had disappeared. At the end of 4 months a slight residue could be still detected.

Of this series, 1 monkey lived with apparently no ill effects. Another developed a slight, but persistent left-sided hemiplegia. Two others developed severe hemiplegias, one right-sided and the other left-sided. The paralyses in each instance apparently developed at the time of injection. At necropsy no evidence of cerebral hemorrhage was found. Another animal died within 24 hours. A hemorrhage was found to have occurred at the base of the brain.

Since our work was begun a few additional references have appeared in the literature. Wustmann injected thorotrast suboccipitally into dogs and monkeys and reports no harmful effects. He feels that his results have solved the problem of the roentgenologic visualization of the cerebrospinal nervous system in animal experimentation, but advises against its clinical application pending further studies. He injected thorotrast by lumbar puncture into a patient with symptoms suggesting a caudal tumor and was able to demonstrate the subarachnoid spaces around the cord and eliminate the possibility of a cord tumor. The patient showed no immediate effects and no remote effects at the end of a year. Wustmann states that the elimination of thorotrast takes place through the perineural lymph channels, as a result of which it is possible to visualize the peripheral nerves. He further claims that the nerves may be injected by injecting thorotrast into the deep soft tissues of the back in the region of the spinal nerves, peripherally to the ganglia.

Similar results were reported about the same time by Jacobi and Löhr, and by Radovici and Meller. Bell and Spurling injected 5 cc. of thorotrast into the spinal canal of a dog. A very satisfactory shadow was obtained, but the dog died within 12 hours. Autopsy showed very extensive inflammatory changes.

It is not possible to reach any very definite conclusions from the above experiments as to the irritative effect of thorotrast on the central nervous system. It is hoped that with improvement in technic this point may be settled. The medium is eliminated but slowly. A more rapid elimination is believed desirable.

It is felt at this time that the method described is not of practical clinical value. The advantage of thorotrast over air is not so great as to warrant the use of such a hazardous procedure. Whether the injection of a small amount of thorotrast directly into the ventricles could be undertaken with safety cannot be said, as in this work no such approach was attempted.

BIBLIOGRAPHY

Bell, J. C., and Spurling, R. G.: Personal communication.

Council on Pharmacy and Chemistry: Thorotrast. J. A. M. A., 1932, **99,** 2,183.

Dandy, W. E.: Ventriculography Following Injection of Air into the Cerebral Ventricles. Am. J. Roentgenol., 1919, **6,** 26.

Jacobi, W., and Löhr, W.: Die Darstellung der peripheren Nerven im Röntgenbild. Arch. f. klin. Chir., 1932, **171,** 538.

Oka, M.: Klinische Anwendung der Lienographie, einer neuen Methode zur röntgenologischen Darstellung von Milz und Leber. Fortschr. a. d. Geb. d. Röntgenstrahlen, 1930, **41,** 892.

Radovici, A., and Meller, O.: Encéphalo-myélographie par le thorotrast sous-arachnoïdien et épidural. Recherches expérimentales. Compt. rend. Soc. de biol., 1932, **109,** 1,382.

Radt, P.: Eine Methode zur röntgenologischen Kontrastdarstellung vom Milz und Leber. Klin. Wchnschr., 1929, **8,** 2,128.

Wustmann, O.: Experimentelle Untersuchungen über die Reliefdarstellung (Umrisszeichung) des Zentralnervensystems im Röntgenbild durch Thoriumkontrastmittel. Deutsche Ztschr. f. Chir., 1933, **238,** 529.

Yater, W. M., and Otell, L. S.: Hepatosplenography with Thorium Dioxide Sol. J. A. M. A., 1933, **101,** 507.

VENTRICULOGRAPHY AND ENCEPHALOGRAPHY BY MEANS OF THORIUM DIOXIDE SOLUTION

Herbert H. Schoenfeld, M.D.

Associate in Neurology,

and

Walter Freeman, M.D.

Professor of Neurology,

George Washington University School of Medicine

Thorium dioxide solution has proved its value as a means of visualization of such viscera as the liver, spleen and lymph nodes, and has been used extensively for arteriography. Its use as a contrast medium in the central nervous system has been begun in experimental fashion, but has been used very sparingly in clinical cases as yet. We are able to report on its use in 2 patients without demonstrable ill effects.

Objections to the use of colloidal thorium dioxide have been based upon its potentially irritating character, and upon the possibility that its radioactivity might give rise to deleterious effects long after the injections had been made. As far as the nervous system is concerned, the latter objection seems inconsequential on account of the small amounts employed and the rapid disappearance from the central nervous system. On the other hand, the possibility of setting up a reactive inflammation in the central nervous system is a serious one, since many investigators have shown that the introduction of foreign material into the ventricular or subarachnoid systems sets up a chronic meningitis or ependymitis that leads eventually to hydrocephalus and cerebral atrophy. This objection has been answered by Wustmann on the basis of experiments that indicate that thorium dioxide is the least irritating of all the contrast media employed and that while the thorium is deposited in the arachnoid meshes there is no significant inflammatory reaction to the presence of the foreign material.

The great theoretical advantages of colloidal thorium dioxide, in our opinion, are that its use in encephalography does not deprive the brain of its buoyant cushion of fluid, and that its greater specific gravity brings the contrast medium into the most dependent portions of the ventricular system, such as the temporal horns, and the floor of the third ventricle, locations that are difficult to demonstrate in cerebral pneumography. These dependent portions, also, are nearer the sensitized film, and are therefore delineated more sharply.

The experimental work leading up to the use of thorium dioxide solution as a contrast medium in the study of the central nervous system has been performed principally by Radovici and Meller, and by Wustmann. Löhr and Jacobi have also contributed to the problem. In this country the work was taken up by Otell, Coe and Hedley. Wustmann made the most careful study, showing the necessity of using a slightly alkaline, buffered, thorium dioxide solution, and he used it successfully in animals before applying it to a patient with a suspected tumor of the cauda equina. The results were so striking that further work is indeed justified. The opaque medium escapes along the lymphatic pathways, clearly outlining the roots and peripheral nerves, and is carried eventually to the regional lymph nodes and into the general circulation. When injected into the cisterna magna of animals the cisterns and fluid pathways are very plainly demonstrated, and the material is carried off both by the blood stream, and along the lymphatics that accompany the olfactory and optic nerves. The material is still visualized in the arachnoid meshes after 2 months, but in very small quantities, and that which was introduced into the ventricles disappears in a few days, only a small amount remaining in the most dependent portions. The animals tolerated the injections well.

The studies by Otell, Coe and Hedley, however, left some doubt as to the harmlessness of the method. One of the animals died during injection, 4 died the next day, 2 further animals showed residual hemiplegia, and only 1 escaped without harm. We believe that these bad results are due to the traumatism of the injection, since these authors mention the fact that only 2 cc. of spinal fluid was withdrawn, while from 4 to 6 cc. of thorium dioxide solution were injected. In some animals the subarachnoid space was quite completely visualized within a few minutes after the injection, and the ventricular system also, but the latter only at times. We believe that too much force was used in these injections, and that the repetition of these experiments, using smaller quantities of the medium and more precise technic, will obviate the disastrous results reported. Radovici and Meller's animals remained in good health after 6 months.

Our studies in human cases have only just begun, but it seems worth while at this time to report on our first experiments.

REPORT OF CASES

Case 1: A white man, 29 years of age, employed as a fireman, was admitted to the George Washington University Hospital on August 4, 1933. The principal complaint of this patient was headache, which began on June 8, 1933, following a mild injury to the suboccipital region. No bone injury was demonstrated at this time. On July 3, 1933, the patient had a sudden convulsion with loss of consciousness for about 30 minutes. There was no aura, nor was there involuntary urination or defecation. Some 7 or 8 such episodes followed at intervals. The remaining history was irrelevant. The positive findings included: Irritability with some confusion, sensitiveness of the suboccipital region, slight engorgement of the retinal veins. Somewhat later hemianesthesia developed on the left side to pin prick and light touch, a positive Babinski sign and asynergia and nystagmus on looking to the left. The patient deviated to the right in walking, and had a positive Romberg sign. On the morning of August 3, 1933, a bilateral ventricular tap was attempted through the posterior horns. After several unsuccessful attempts to 'needle' the right ventricle, the left ventricle was entered, and a very slow flow of cerebrospinal fluid resulted. Since it was believed that the ventricle was not large and that sufficient air could not be injected to obtain satisfactory roentgenograms, colloidal thorium dioxide as a contrast medium was injected. About 5 cc. of thorium dioxide solution (thorotrast) was drawn into a small glass syringe. The syringe was fixed to the brain needle through which cerebrospinal fluid was drawn and the fluid and thorotrast intimately mixed before injecting the total quantity into the ventricle. Some ventricular fluid had previously escaped. Immediate roentgenograms were made with the head in various positions. These films gave a detail of the ventricles, particularly in the terminal recess of the temporal horn, which was far superior to that of air. The films made 24 hours after injection showed no remaining shadow in the ventricles. There was no distortion that could be interpreted as due to tumor, and a final diagnosis was not made. The presence of left homonymous hemianopsia was noted on the evening of August 4, 1933. This cleared up promptly, and was probably due to the trauma of operation. There was no other reaction, the patient was discharged on the sixth day and was lost sight of 6 weeks later, unchanged.

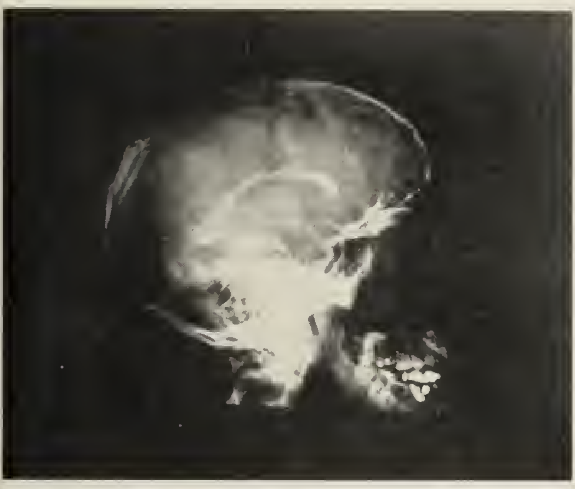


FIG. 1. CASE 1. LEFT LATERAL ROENTGENOGRAM FOLLOWING INJECTION OF THORIUM DIOXIDE SOL. INTO THE LEFT LATERAL VENTRICLE.

The temporal horn is clearly visualized.

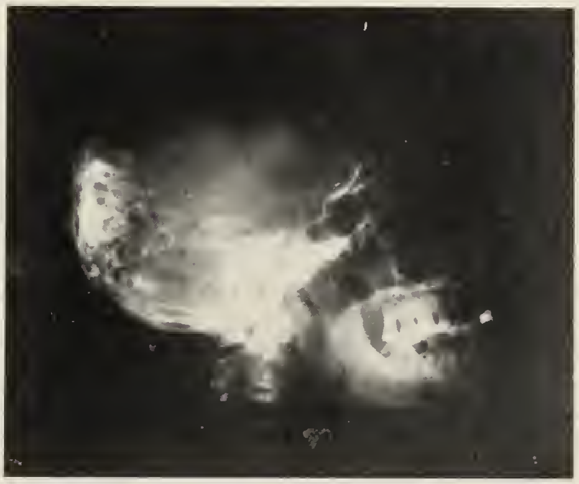


FIG. 2. CASE 2. LEFT LATERAL ROENTGENOGRAM FOLLOWING INJECTION OF THORIUM DIOXIDE SOL. INTO THE SUBARACHNOID SPACE OVER THE OCCIPITAL POLE

Case 2: A colored laborer, 63 years of age, was admitted to the Gallinger Municipal Hospital, August 19, 1933. He appeared ill, was complaining of headache, vomiting, generalized muscular twitchings, and a course tremor of his hands. The blood pressure was 130 systolic and 84 diastolic. This man had had several previous admissions because of vomiting of sufficient degree to cause suspicion of an incomplete intestinal obstruction. No obstruction was demonstrated in the course of his examination. A positive Wassermann and Kahn reaction was found in the blood. Lumbar puncture on August 23, 1933, showed a normal cerebrospinal fluid under normal pressure. Neurological examination showed blindness of the right eye. The right pupil was larger than the left. The right fundus was pale over the temporal three-quarters, and the nasal border was indistinct. Except for a positive Babinski sign on the left, no other neurological abnormality was found. On August 30, 1933, bilateral posterior horn tap was attempted. Both ventricles were apparently entered by the needle at a very shallow depth of about 1.5 cm. Some cerebrospinal fluid was lost through the needle on both sides. About 5 cc. of thorium dioxide solution was mixed with cerebrospinal fluid in the syringe attached to the brain needle on either side and then injected. Immediate x-ray films were made, which showed the thorium dioxide spread out over the cortex of the occipital lobes. This distribution is thought to be due to the fact that the fenestra did not enter the ventricles, and in consequence the material was injected into the subarachnoid spaces. No unusual reaction followed the procedure, and the patient feeling better than when he entered the hospital refused to allow further study to be made.

As far as we know, colloidal thorium dioxide has not previously been used in encephalography in human subjects. No unusual reaction occurred in these cases, and we wish particularly to call attention to the fact that a very small quantity of the medium was sufficient for satisfactory visualization. We would further suggest that if the material used does not produce late deleterious effects, it might be a safer medium than air, for the reason that marked changes in intraventricular pressure with its associated dangers might be avoided.

BIBLIOGRAPHY

Otell, L. S., Coe, F. O., and Hedley, O. F.: Thorotrast Ventriculography and Encephalography. Read at meeting of Sect. Nerv. and Ment. Dis., Med. Soc. Dist. Col., Oct. 5, 1933.

Radovici, A., and Meller, O.: Encéphalo-myélographie par le thorotrast sous-arachnoïdien et épidural. Recherches experiméntales. Compt. rend. Soc. de biol., 1932, **109**, 1,382.

Radovici, A., and Meller, O.: Encéphalo-myélographie liquidienne. Presse méd., 1932, **40**, 1,933.

Radovici, A., and Meller, O.: Über eine neue Methode der Encephalographie. Klin. Wchnschr., 1933, **12**, 429.

Wustmann, O.: Experimentelle Untersuchungen über die Reliefdarstellung (Umrisszeichung) des Zentralnervensystems im Röntgenbild durch Thoriumkontrastmittel. Deutsche Ztschr. f. Chir., 1933, **238**, 529.

PREGNANCY IN HEART DISEASE

Worth B. Daniels, M.D.

Clinical Professor of Medicine,
Georgetown University School of Medicine

Every physician has among his patients certain individuals suffering from heart disease, and the question of the advisability of childbearing must at times be considered. No more serious or important decision ever confronts him, since upon his advice the patient either reluctantly resigns herself to a childless existence or goes forward with pregnancy equipped with a structurally impaired heart. The average physician, however, encounters the combination of these two conditions too infrequently to know from experience what his advice should be. Mackenzie, who early interested himself in this subject, phrases well the average physician's dilemma. He says: "When one comes to estimate the opportunities the physician has for dealing with the relation of heart disease to pregnancy, one soon discovers that his practice never brings him into contact with pregnant women except when one of the latter is referred to him for an opinion. On these occasions it frequently happens that instead of frankly recognizing that his experience does not justify him in claiming a knowledge of the subject, he gives a prognosis of the 'guarded' type. He says in effect: 'The patient may undergo pregnancy safely; on the other hand, there is a possibility that she may not.' The effect of this is that the patient is left with a vague notion that some dread fate hangs over her head. In other instances the physician 'plays for safety' and forbids the pregnancy yet these patients may be perfectly capable, in many cases, of undertaking it."

Having found myself in the untenable situation of rendering opinions upon a subject in which I was too little experienced, it occurred to me that a study of the best literature on this subject would be of general interest and of value to others in a similar position. The obstetrician's specialized training in the conduct of pregnancy and labor does not equip him for handling adequately the cardiac patient who comes for prenatal care and delivery. The problem is more a medical than obstetrical one. The pregnancy is assumed to be normal and complicates the heart disease and not the reverse. The management, therefore, of such a patient is a joint problem for the obstetrician and for the internist. The latter in making any decision as to whether pregnancy may be allowed or continued must know from the obstetrician whether any mechanical difficulty is likely to be encountered in labor, since this forecasts to a considerable extent the strain that the patient's heart must bear.

There has been a considerable controversy as to the effect of pregnancy upon the normal heart. A great deal of evidence was early brought forward to indicate that actual hypertrophy occurs incident to the increased demand for work. A woman well on in pregnancy shows a displacement of the apex beat to an inch or more outside the midclavicular line, swelling of the ankles, breathlessness on exertion, venous stasis in the lower extremities, markedly visible jugular pulsations and frequently a systolic murmur at the apex with crepitations at the lung bases. All these findings are extremely suggestive of cardiac impairment. Mackenzie published in 1904 an excellent treatise upon the normal heart in pregnancy in which he showed that all these findings were the result of position and pressure changes and disappeared entirely following delivery. He felt quite sure that many an alert physician had unduly alarmed his patient by attributing these findings to a failing circulation. Gammeltoft of Copenhagen has recently published an article showing that in the final two months of pregnancy 16 per cent of women show signs strongly suggestive of organic heart disease. It has been shown by Stander and others that normal gestation is accompanied by a marked increase in cardiac work. As to whether this is due to actual temporary hypertrophy or simply to use of the reserve force of the heart is not known. He has found that the cardiac output in the normal nonpregnant woman is 2.2 to 2.3 liters per square meter of body surface per minute and that this output steadily rises in pregnancy until at term it reaches 4.58 liters, or more than double its original quantity. Barcroft's ingenious experiments, too, showed contraction of the spleen in pregnancy with a resulting great increase in circulating blood. It is, therefore, obvious that real additional strain is thrown upon the heart during gestation and that this strain is ever increasing until labor is completed. We see then that the woman with cardiac impairment must with a more or less inefficient organ do a great deal more than the accustomed work.

The incidence of heart disease in the pregnant woman varies to some extent in different localities. White states in his volume, "Heart disease," that 2 per cent of the pregnant women in New England complain of heart symptoms and that 1 per cent have actual organic cardiopathies. Campbell finds the same incidence in Montreal, while Daly in Chicago and Schaupp in San Francisco report 2.8 per cent and 2.7 per cent respectively. Rheumatic heart disease because of its occurrence in young individuals accounts for by far the greatest number of cases, about 90 per cent. Congenital lesions, luetic aortitis, hypertension and subacute bacterial endocarditis are rarely the etiological agents in the heart disturbances found in pregnant women. Mitral stenosis leads the list of valve lesions found. Table I which I have compiled by using the statistics of several authors quite clearly indicates the frequency of the various heart lesions in pregnancy.

TABLE I

STATISTICS FROM LITERATURE AS TO FREQUENCY OF VARIOUS TYPES OF HEART LESION

LESION	KELLOGG	PARDEE	WHITE	MC ILROY	DALY	TOTAL
Mitral Insufficiency	52	29	5	4	48	138
Mitral Insufficiency and Stenosis	44	34				78
Mitral Stenosis	10	35	36	123	42	246
Mitral Insufficiency and Aortic Insufficiency	3	5			1	9
Double Mitral and Aortic Insufficiency	2	3	10	22	1	38
Aortic Insufficiency	2	4		6	5	17
Congenital		2		8	5	15
Mitral Stenosis and Double Aortic			1	6		7
Myocardial Conditions				27	8	35
Luetic Aortitis					5	5
Aneurism					1	1
Chronic Adhesive Pericarditis					1	1
Total Patients						590

Mitral stenosis was present in 62.5 per cent of these cases. It is evident from the table that our discussion of heart disease in pregnancy is almost entirely one of rheumatic heart disease. The various arrhythmias, especially auricular fibrillation, are also of great importance.

The mortality of heart disease complicated by pregnancy shows so wide a variation in the early and late reports that it is obvious that a different degree of involvement is being reported. This difference in mortality statistics, too, indicates that many cases of organic heart disease were going through pregnancy entirely unrecognized. The older authors report series of cases with mortality rates of from 30 to 60 per cent. One author definitely states that no routine examination was made of women coming for delivery in the wards of his hospital, but that cardiac disease was recognized only when the patient's complaints or symptoms were severe enough to demand cardiovascular examination. These statistics written to warn the practitioner of the dangers of pregnancy and heart disease have produced a profound state of pessimism, and to a considerable extent this is unfounded. Reid compiled 39,976 deliveries from the Boston Lying-In, the New York Lying-In and the Robinson Hospitals, with 402 maternal deaths, 0.98 per cent. Of these deaths 9.7 per cent were due to heart disease. This large series consists of cases followed closely from the beginning of pregnancy and those rushed to the hospital grossly decompensated and in labor. It, therefore, gives no indication of what can be expected in women carefully handled in well organized prenatal cardiac clinics. If, then, the mortality described above is excessive and no longer occurring in well conducted obstetrical clinics, how has it been reduced and what can be hoped for?

In order to obtain an idea of the developments which have lead to a better understanding of the pregnant cardiac, one must briefly survey the past developments in this subject. The invention of the stethoscope by Laennec produced rapid advance in the knowledge of cardiac pathology and centered the attention of the physician upon the bizarre sounds that could be detected on auscultation in heart disease. Indeed, the former methods of evaluating the strength of a heart by what it could do were almost entirely forgotten until resurrected by the tireless observations of Mackenzie. In his work on heart disease in pregnancy which extended over a period of 30 odd years and culminated in the publication of a monograph on this subject in 1921, he places particular emphasis as always on the function of the heart and very little on the structural changes. In speaking of mitral stenosis which is certainly the most common valve lesion and the one which accounts for most deaths in the cardio-pregnant woman he lays down the following principles: "When 10 or 15 years after rheumatism there is mitral stenosis, no edema of the lungs and the response to effort is good, the woman may become pregnant with fair assurance. When in mitral stenosis even many years after rheumatism there is decreased response to effort indicated by breathlessness, tachycardia, or easy palpitation there is danger in pregnancy. When the heart is enlarged in mitral stenosis and effort easily produces dyspnea pregnancy should be forbidden. If undertaken in spite of advice and lung crepitations supervene it should be terminated." We see then that Mackenzie speaks little of character of the heart sounds, duration and pitch of murmurs but constantly of response to effort. He is persistently emphasizing as a criterion for successful parturition an adequately functioning heart, not one of small size and normal sounds. This newer attitude of function as the paramount consideration in evaluating the condition of the heart has only too slowly made its way into the minds of the average practitioner. For that reason women with valve lesions producing much noise and little or no disturbance of function have been relegated to childless marriage, and women with only faint murmurs but considerable impairment of cardiac power have been launched on stormy and dangerous pregnancies.

The American Heart Association by establishing a classification of heart disease on a basis of heart function has now made it possible for observers of pregnant women with cardiopathies so to classify their patients that some really intelligent statistics may be gathered. In reading the reports of many of the older authors one is entirely unable to ascertain whether the specific case under discussion is a woman with a history of rheumatism 20 years ago with subsequent presystolic rumble and a perfectly adequate heart, or a woman with great cardiac enlargement and congestion of the lungs and viscera. It is obvious that data drawn from such unclassified cases are of very little value in learning what one may expect individuals with varying degrees of cardiac disease to do in the presence of pregnancy. It is still, of course, impossible to make any 100 per cent predictions in rheumatic pregnant cardiacs, nor is it even in the nonpregnant ones.

Pardee early used the classification of the American Heart Association in grouping the pregnant cardiacs coming for prenatal care at the New York Lying-In Hospital. He also devised certain not perfect but very helpful tests on which to base classification.

Organic Heart Disease is divided into four classes: I, IIa, IIb, and III.

Class I: Those who are able to perform ordinary or usual physical activity without unusual fatigue, palpitation or dyspnea.

Class IIa: Those who are able to perform the usual normal physical activity but who have discomfort in so doing. Such a person would have noticed an increase in shortness of breath after climbing stairs, walking against a wind or up grade or after such things as housecleaning or lifting heavy articles. Those patients would by some be said to be "fairly well compensated."

Class IIb: Those who are unable to perform the more difficult features of ordinary physical activity without stopping on account of fatigue, shortness of breath or palpitation. Such activities would be climbing 2 flights of stairs or walking at an ordinary rate for one-half minute. These patients might be called "somewhat decompensated."

Class III: Those who are unable to perform the simplest physical activity without fatigue, shortness of breath or palpitation. Such a patient would be unable to walk 200 feet or climb a flight of stairs without resting and would be unable to do any housework. These might be said to be "much or definitely decompensated."

The patients are classified by careful history taking and by personal observation as to their response to effort. Minute inquiry should be made into the history of rheumatism and its frequency and time. Patients with acute rheumatic fever recently are bad risks for any strain even if their present condition seems to indicate a satisfactorily functioning heart. History of decompensation in the past is also carefully asked for. In classifying, too, one must take into consideration in the pregnant woman the limitation of activity that the pregnancy itself necessarily imposes. At times early sickness of pregnancy will deplete the patient so that palpitation and dyspnea with very easy fatigue may be encountered. This, of course, should be discounted. For observing personally the individual's reaction to effort, Pardee has devised a simple test by which classification is facilitated. The patient swings a 10-pound dumbbell (5 pounds in small women) from between the legs to over the head 20 times. The pulse and breathing are noted. A normal reaction consists of moderate tachycardia and dyspnea which disappears in 1 to 2 minutes. These patients are placed in Class I. If there is marked dyspnea or tachycardia these are placed in Class IIa or IIb; if the test can just be performed in Class IIb. Class III patients can usually do no more than 5 to 6 swings of the dumb-bell and then must stop. In addition to classification by function and functional tests it is generally agreed by most of the authors read by me that patients with auricular fibrillation should be placed in the unfavorable Class III regardless of function. White believes that patients with a high degree of aortic insufficiency should also be placed in this class. It will be noted that the size of heart and the etiology is given little or no consideration in this classification. The statement is made by most observers that patients with cardiac enlargement and Class I function are as likely to do well as those with small hearts.

In surveying the literature I have been able to collect quite a large series of case reports of pregnant cardiacs classified either under the American Heart Association classification or under an original system capable of being interpreted in the terms of this system. I have, in Table II, brought together 1,364 cases. These give very strong support to the contention of Mackenzie, Pardee, White and others that by careful observation of response to effort a very accurate prognosis can be made as to what the pregnant cardiac women will do during pregnancy, labor and the puerperium.

TABLE II

Summary of Mortality Statistics from the Literature of the Past 15 Years

AUTHOR	TOTAL CASES	I		IIa		IIb		III		TOTAL MATERNAL CARDIAC DEATHS	MATERNAL CARDIAC DEATHS
		Cases	Maternal Cardiac Deaths	Cases	Maternal Cardiac Deaths	Cases	Maternal Cardiac Deaths	Cases	Maternal Cardiac Deaths		
											per cent
Pardee	112	75	0	20	0	11	1	6	2	3	1.8
Hamilton and Kellogg	519	267	0					252	16	16	3
Breed and White	53									2	4
Corwin and Herrick	196									12	6
Mc Ilroy and Rendel	227	58	0	95	0	64	4	10	1	5	2.2
Daly and DeLee	117									1	0.8
McClure	45									2	4.4
Gilchrist	95	13	0	26	0	45	2	11	6	8	8.3
	1,364	413	0	141	0	120	7	279	25	49	3.8
			554								

It will be noted from this table that no woman in Class I or Class IIa died of heart disease and there were 554 women included in this class, whereas in Class IIb there were 7 deaths out of 120 women or about 6 per cent and in Class III, 25 deaths out of 279 women or 9 per cent. This certainly strongly indicates that this method of prognosticating in the hands of many different observers in 8 different cardiac prenatal clinics is of very great value. It also shows that pregnancy in the cardiac patient who has a satisfactorily functioning heart and no recent history of rheumatism may be undertaken without great fear. In Kellogg and Hamilton's cases reported from the cardiac clinic of the Boston Lying-In Hospital there is an astonishing difference in the first and last 3 years in both maternal and fetal mortality. During the years 1922 through 1924 the maternal mortality was 15.2 per cent and the fetal mortality 26 per cent. In the following 3 years, 1925 through 1927, the maternal mortality fell from 15.2 per cent to 3.3 per cent, and the fetal mortality from 26 per cent to 19.9 per cent. They attribute this splendid improvement in their results to improvement in diagnostic methods and the early recognition of mitral stenosis; to stubborn prenatal control; to hospitalization of all decompensated cardiacs under the joint care of an obstetrician and cardiologist; and to the sterilization of certain cardiacs who would have been bad risks in another pregnancy. They feel, too, that their experience with the cardio-pregnant woman made them much more capable of rendering better care to the subsequent cases.

Certain of the less common causes of heart disease in pregnant women need a few words of consideration. As has been said, auricular fibrillation is very serious when pregnancy occurs as a complication or when it supervenes during pregnancy. White feels that it is always an indication for the termination of pregnancy, as do most observers. Robinson reports 18 cases of fibrillation in pregnant women with a mortality of 66 per cent. Luetic aortitis with aortic insufficiency is rarely found, but if it occurs the prognosis is poor. Life is probably prolonged by abortion, but under any conditions there is a gloomy outlook. The congenital heart lesions occur less frequently than one would expect. Only 2.5 per cent of the cases shown in the table I have compiled fall into this group. The disposition of these cases seems relatively easy since only the structural defect and the function of the heart must be considered. There is no disease of the heart muscle. White and Breed dismiss these cases succinctly by stating: "If a patient with congenital heart disease has survived to the age of childbearing without showing signs of incapacity for normal activity, she will certainly be able to pass through pregnancy and labor without difficulty." Subacute bacterial endocarditis appears to be an extremely rare disease during gestation. Kobacker, in 1930, reported 1 case in which the diagnosis was made in the third month of pregnancy. The patient was allowed to continue with pregnancy and was delivered at term in a moribund state. Culture from the cord was positive for Streptococcus viridans, but within one week the child's blood stream was clear. Kobacker states that he can find reports of only 4 other incidences of this disease complicating pregnancy. Auricular paroxysmal tachycardia is apparently not a serious complication if it can be controlled. However, its persistence in a patient with an impaired heart often leads to failure and the necessity for terminating the pregnancy. Hermann and King of New Orleans write of a case of complete A. V. heart block which had existed since the age of 20. This patient bore 6 children during this period without difficulty. This is, of course, an unusual case and must be looked upon as a great rarity. Heart block in pregnancy is generally a bad prognostic sign.

Aside from the immediate result of parturition in the cardiac patient one must consider the question of its ultimate effect on heart reserve and length of life. There is a sharp divergence of opinion on this subject. It has generally been stated that the cardio-pregnant woman pays with years of life for every pregnancy she goes through. Many believe that the cardiac reserve is very seriously impaired in cardiac patients who go through pregnancy. These statements have usually been made without considering that the natural evolution of rheumatic heart disease is towards almost inevitable failure and eventual death. The only way this moot point can ever be settled is by following comparable groups of rheumatic cardiac patients who have and who have not borne children. Some progress has been made in the direction of 'follow-ups' of women after their labors. Herrick states that with good care pre- and postpartum the average ambulant cardiac patient may look forward after delivery to a cardiac reserve at or near her former level. In 109 of his cases which he was able to follow and examine from 2 months to 2 years (average 1 year) after delivery, 7 were dead at the end of 3 months. He feels that this may not be higher than the expected mortality of any group of chronic cardiac patients without the complication of pregnancy. Of the 109 patients, 72 or 66 per cent were free from cardiac symptoms. Daly of DeLee's clinic in Chicago reports a maternal mortality rate of less than 1 per cent and an incomplete recovery rate of 3.5 per cent. He has, therefore, a complete recovery rate of over 95 per cent in cases followed from 6 months to $2\frac{1}{2}$ years postpartum. He feels that a strict and detailed convalescence to a great extent accounts for his excellent final results. Exercise is increased extremely slowly until the patient can climb a flight of stairs without the slightest embarrassment. His fine social service department keeps the patient under constant surveillance so that they are prevented from plunging themselves immediately into the excessive strain of housework and care of the child. Reid of Boston has studied carefully the effect of parturition on the rheumatic cardiac patient. He believes that women with rheumatic heart disease die during the childbearing period because of the natural evolution of the disease and not because of marriage and pregnancy. He has reviewed all the autopsied cases of pure mitral stenosis at the Boston City

Hospital. His findings are summarized as follows:

Age at Death of Patients with Pure Mitral Stenosis

	Years
Entire Group, Males and Females	43.2
Men	38.6
Women	44.8
Unmarried Women	47.2
Married Women	42.4

The women in this table who had borne children averaged 5.75 children each. Reid further calls attention to the fact that combining the statistics of age at death of patients with rheumatic heart disease compiled by Willius, Coombs, Cohn, Cabot and Reid gives the following:

	Years
Males	40.8
Females	39.0

Obviously there is little difference in age at death. "The status," says Reid, "of the unmarried woman with heart disease is much closer than is usually taught to that of the male cardiac patient who is contemplating marriage. The prospective mother has the problem of whether she can adequately care for her future children. There is also the possibility of the early death of the male parent causing the leaving of dependent children." White also believes that it is difficult to prove that pregnancy and labor actually shorten the life of rheumatic cardiac patients. He feels this, too, because of the natural outcome in this type of case. It is apparent, therefore, that if a patient goes through her pregnancy and labor reasonably satisfactorily there need be no great fear that her life expectancy will be greatly decreased nor will she be more likely to suffer a significant diminution of her cardiac reserve.

In pregnant women with heart disease antenatal care is of the greatest importance. The lowering of mortality which has been effected in some clinics is to a very great extent due to early recognition of heart disease and scrupulous care during the prenatal period. Daly states that during this period he 'conditions' his pregnant cardiac patients for labor just as the trainer of an athlete 'conditions' his man for a hard race. This period of 'training' is most essential. The extent of damage to the heart and the patient's general condition dictate the type of care. In Class I patients, practically no care above that taken by the ordinary pregnant woman is necessary. She needs some mild exercise, as do all individuals, to maintain her best health. This exercise, however, should during pregnancy be mild in character, such as walking, and should be stopped before the point of fatigue. Longer than usual periods of rest should be insisted upon. In Class IIa cases, a similar régime with less exercise and more rest is advisable. Probably these patients should spend 1 day a week in bed during the last half of pregnancy even if no heart symptoms are present. In the more advanced cases in which symptoms and signs of failure are present absolute rest in bed is essential. This should be supplemented by digitalization, limitation of fluids, dry diet, diuretics and the other measures used in the ordinary cardiac case to restore compensation. It is generally stated that pregnant women in cardiac failure respond about as well as nonpregnant to the usual medical methods instituted. There is general relief from experience that no attempt should be made to induce labor or abortion during decompensation, but the obstetrician should wait until compensation can be restored by medical means. If compensation can not be restored and termination becomes essential a grave situation exists. Without delivery the patient may die, but with forcible delivery she will almost surely perish. Herrick has stated a good medical equation: "Cardiac decompensation plus forcible delivery equals death." He feels that in the impasse where failure is not responding to medical treatment "it is usually best to trust nature more and art less" and allow these patients to deliver themselves. He says that probably 50 per cent of them will die, but that this type of case already has very little life expectancy. There is quite general agreement that if signs of failure occur prior to the sixth month of pregnancy, even when the failure clears rapidly and completely under treatment, the pregnancy should be terminated. Failure is almost sure to occur again if termination is not effected. There is not general agreement as to whether the pregnancy should be terminated because of a similar situation arising after the sixth month. Newell feels that if under these conditions response to medical treatment is good the patient may be carried on until well into the last month and Cesarean section and sterilization performed. This might be justifiable in a primipara who is anxious for children, but it seems too great a risk to take in a multipara with living children, especially when we consider the rather high fetal mortality in cardiac patients. The hazard is too great to take when a living child may not be obtained.

The obstetrical handling of cardiac patients, though entirely out of my field, should be discussed. Newell advises abdominal abortion when sterilization is necessary. First, it would seem evident from the statistics which we have gathered that only Class I and Class IIa patients should be allowed to become pregnant. If the patient presents herself after conception and is in either Class IIb or Class III she should be aborted immediately or as soon as medical treatment can prepare her for this procedure. Kellogg advises dilatation and currettage under morphine and ether if the patient is in good or fair shape and under morphine alone if gross decompensation is present. McIlroy and Rendel of London advise the catheter method of inducing abortion, since they feel there is less attendant shock than in dilatation and currettage. Lack of experience in this line makes me entirely incapable of discriminating between the various procedures advocated. During the fourth, fifth, and sixth months of pregnancy Kellogg prefers for every type of case vaginal hysterotomy with perforation of the after coming head and as second choice the use of a bag for dilatation followed by version and perforation of the head. During the seventh and eighth months most obstetricians seem to prefer Cesarean section if sterilization is needed or the use of a bag followed by forceps at full or nearly full dilatation of the cervix. At term the question of section or delivery from below is debatable. Fortunately labor in cardiac patients is likely to be mechanically less difficult than in normal women because their babies are usually small and some degree of prematurity is common. In DeLee's clinic, section is advised only for obstetrical reasons or when sterilization is to be accomplished. In other cases forceps are used at full or nearly full dilatation of the cervix. Daly states that recovery in the Cesarean section group was considerably less rapid than in those delivered from below. Kellogg says that at term Cesarean section is certainly the easiest way to deliver cardiac patients, but because this adds to the risk of mortality it is avoided except for those women in heart failure and for obstetrical reasons. The bulk of his patients are delivered by forceps after the first stage.

All authors state that the anesthetist is more important than the type of anesthesia used. In these cases only the most expert anesthetists should be employed. Ether seems to be the anesthesia of choice according to most authors, but this is probably because the bulk of these reports are of cases done prior to the general use of ethylene. The latter because of its easy induction is a safe anesthetic for cardiac patients. Local anesthesia is the preferable method for Cesarean section.

Sterilization should be accomplished by resection of the tubes in all cardiacs who have borne their pregnancy badly. It probably, too, should be done on multipara who have living children. If Cesarean section has been performed this is an easy matter, but if the patient has been delivered from below this may well be done at a later period.

Conclusions

1. Added care in the selection of cardiac patients who are to be allowed to become pregnant or carry on with parturition will significantly reduce the mortality in these patients.

2. Consideration of the functional ability of the heart is more important than the etiology or the type of structural change.

3. Classification according to the system advocated by the American Heart Association will facilitate the process of deciding which patients may carry through their pregnancies with reasonable assurance and which should have their pregnancies terminated.

4. It is probable that pregnancy and labor do not significantly shorten the lives of women with rheumatic heart disease nor does it make any great inroads on their cardiac reserve. They die before their time because of the natural evolution of the disease.

BIBLIOGRAPHY

Breed, W. B., and White, P. D.: Heart Disease in Pregnancy. Boston M. & S. J., 1923, **188,** 984.

Campbell, D. G.: Pregnancy and Heart Disease. Canad. M. Ass. J., 1923, **13,** 244.

Corwin, J., and Herrick, W. W., et al: Pregnancy and Heart Disease. Am. J. Obst. & Gynec., 1927, **13,** 617.

Daly, P. A.: The Heart in Pregnancy. J. A. M. A., 1924, **82,** 1,439.

Gammeltoft, S. A.: The Heart in Pregnancy. Surg. Gynec. Obst., 1928, **46,** 382.

Gilchrist, A. R.: Heart Disease in Relation to Pregnancy. Edinburgh M. J., 1931, p. 121.

Hamilton, B. E., and Kellogg, F. S.: Cardiac Disease in Pregnancy; Prognosis; Medical and Obstetric Handling. J. A. M. A., 1928, **91,** 1,942.

Herrmann, G., and King, E. L.: Cardiovascular Disturbances in the Obstetric Patient With Especial Reference to Electrocardiographic Observations. J. A. M. A., 1930, **95,** 1,472.

Kellogg, F. S.: Chronic Valvular Heart Disease in Pregnancy and Labor. Boston M. & S. J., 1917, **177,** 398.

Kobacker, J. L.: Subacute Bacterial Endocarditis Complicated by Pregnancy. J. A. M. A., 1930, **95,** 266.

Mackenzie, J.: Heart Disease and Pregnancy. Oxford, Frowde & Hodder, 1921.

McClure, H. I.: Pregnancy Complicated by Heart Disease. J. Obst. & Gynaec. Brit. Emp., 1932, **39,** 357.

McIlroy, L., and Rendel, O.: Problem of Damaged Heart in Obstetrical Practice. J. Obst. & Gynaec. Brit. Emp., 1931, **38,** 7.

Newell, F. S.: The Treatment of Cardiac Complications of Pregnancy and Labor. Boston M. & S. J., 1927, **197,** 757.

Pardee, H. E. B.: Experiences in the Management of Pregnancy Complicated by Heart Disease. Am. J. Obst. & Gynec., 1929, **17,** 255.

Reid, W. D.: The Heart in Pregnancy. J. A. M. A., 1930, **95,** 1,468.

Robinson, A. L.: Effect of Parturition on the Heart; 18 Cases of Pregnancy Complicated with Auricular Fibrillation. Lancet, 1927, **1,** 170.

Schaupp, K. L.: Cardiac Decompensation During Pregnancy and Labor. Calif. State J. M., 1923, 21, 290.

Stander, H. J., and Cadden, J. F.: Cardiac Output in Pregnant Women. Am. J. Obst. & Gynec., 1932, **24,** 13.

White, P. D.: Heart Disease. New York, Macmillan Co., 1931.

The Soul of Medicine.—But what of the problems ahead? Perhaps the most insistent and immediate problem is the so-called "cultist." A charlatan is one who knowingly deceives for personal gain, and it is history that we have always had these in our midst. Mankind has always developed a certain percentage of credulous individuals usually, but not always, of rather low mentality who crave the bizarre. It even has been said that their birth-rate is one per minute. But if one makes type-studies of those individuals who consult and contribute to the maintenance of that more respectable pseudomedical practitioner whom we call the "cultist," he will find very few individuals who seem to have been born on the stroke of the minute. He will discover in their ranks some of our seemingly most intelligent citizens, and, if he inquires of those individual intelligentsia the reason why they prefer the cultist to his far better educated and equipped medical opponent, he will hear much to make him think. He even may begin to suspect that some of the reason has to do with the type of service that has been received at the hands of our profession.

No one who has gone far in the study of medicine can feel that the public is safe in the hands of those of such limited vision and education as are the cultists. And certainly it is the duty of profession devoted to service to mankind to do all that it honestly can to protect the public against such dangerous inefficiency. In carrying out such a protective function, however, our every act should be subjected to the closest scrutiny lest we do more harm than good and bring immeasurable discredit to our art. It should not be dictated by a spirit of economic self-protection, but solely by the undeniable fact that such efforts at public protection are the duty of those in a position to know the dangers. We should not view these individuals as competitors, but as menaces to the public health. For this reason, and this reason alone, we should lend support to those who, like our dean, Dr. Patterson, have a gift for blocking unwise legislation which, if allowed to pass would work incalculable harm upon the public.

We should not, however, blind ourselves to the fact that many of their patrons are our dissatisfied patients looking for the relief that we did not give them. Such being the case, the most elemental view of the situation would be that we individually could do much if we improved the type of service rendered.

We sense much of this call in a consideration of a far larger medical problem of the future which we have embraced under the rather inclusive term of State Medicine. It is obvious to one who studies the problems presented by this growing public or political trend that it is not entirely based upon matters of economic expediency. Looming rather largely in its discussion is the question of the character of medical service, and just to the extent that this criticism may be merited does it reflect upon the high standard of the practice of medicine and upon those who have exercised its privileges and duties

A business concern faced with such problems would make an exhaustive study of their causes and take the most drastic steps to eradicate them. If it found that its former friends had deserted it because of the quality and appearance of its product, it immediately would correct these faults and try to show its former adherents that they were corrected. It would not feel abused because another had gotten what it had lost. It would shoulder its own responsibility and not let the same thing happen again.

I wonder if we cannot find in this a lesson that we might adopt with much profit to those who need our ministrations and much credit to our profession. We are dealing in mandkind's most important commodity, health. Without health there is neither comfort nor happiness. One man's health is as important to him as is health to his brother. And it is probable that the surest and certainly the most admirable way in which we could overcome the public menace of the cultist and the public misfortune of state medicine would be to give the best we have in skill and judgment to every patient we treat. It is not a question of monetary compensation, but a matter of fulfilling an idea and giving to those who depend so largely upon us the things we would have for ourselves under like circumstances. Of such is the soul of medicine.—Charles E. G. Shannon, M.D., Extract from introductory address delivered at the opening of the 107th session of the Jefferson Medical College, October, 1931. Reprinted from The Diplomate, June, 1932.

The Fundamentals of Internal Medicine*

DISEASES OF THE HEART

(Continued from November, 1933)

Wallace M. Yater, M.D.

Professor of Medicine,
Georgetown University School of Medicine

Etiologic Types of Heart Disease

HYPERTENSIVE HEART DISEASE

Etiology.—Heart disease due to hypertension is common because hypertension is common. Perhaps 95 per cent of cases of hypertensive heart disease result from essential hypertension, the others mainly from hypertension secondary to chronic glomerular nephritis.

Essential hypertension is common after the age of 40 years, but it may occur in younger individuals and occasionally even in children. Hypertension frequently occurs earlier in American negroes than in whites, but it is uncommon in native African negroes. Males and females are about equally affected. Heart failure from hypertension is most common after the age of 50 years, since a number of years usually elapse after hypertension begins before heart failure ensues.

Physiological and Pathological Considerations.—Since essential hypertension, and also probably the hypertension secondary to chronic nephritis, is the result of generalized arteriolar constriction (except pulmonary) which means increased peripheral vascular resistance, the heart, and particularly the left ventricle, must perform more work with each beat in order to pump the normal amount of blood through the organs and tissues. As time goes on, the myocardium of the left ventricle, like all overworked muscle, becomes hypertrophied. This hypertrophy is insidious and progressive, and for a long time may not be detectable on physical examination. By the time the heart is weakened by the continuous overwork, however, it is usually greatly enlarged.

As the heart begins to become fatigued, dilatation of the left ventricle slowly ensues, and progressive pulmonary stasis results producing dyspnea on exertion. The right ventricle then begins to feel the strain and itself slowly becomes hypertrophied and finally dilated. General venous stasis ensues with slowly progressive edema of the organs, expecially the liver, and of the subcutaneous tissues.

In perhaps 40 per cent of cases of heart failure from hypertensive heart disease the coronary arteries, due to the strain imposed upon them by the increased blood flow through them, eventually become degenerated, and coronary arteriosclerosis is said to exist. The efficiency of the coronary circulation is impaired, and this impairment adds to the myocardial insufficiency. In an occasional case coronary thrombosis may occur and may cause death before death might result from congestive failure.

Pathologically the heart after death often shows nothing but hypertrophy and dilatation, the hypertrophy affecting mainly the left ventricle. The myocardium may appear normal, even microscopically, except for hypertrophy of the fibers. The average normal weight of the heart of men is about 300 grams, of women 250 grams, or about 0.45 per cent of the body weight. The heart in hypertensive heart disease may attain a weight of 500 grams, occasionally more and even up to 1,000 grams. If coronary arteriosclerosis coexists, the coronary arteries slow the usual atheromatous and sclerotic changes. Some increase in interstitial connective tissue of the myocardium may be present, but usually this is not great in amount.

Symptoms and Signs.—Hypertension and cardiac hypertrophy may exist for years without symptoms. In such a stage the patient can not be said to have actual heart disease but potential heart disease. He may die as a result of some other complication of hypertension or some unrelated condition before heart failure sets in. The symptoms may, therefore, be only those of hypertension, which are usually none or slight until complications occur.

---

* This is the second instalment of a treatise on Diseases of the Heart prepared to orient the older graduates of medicine in the changing concepts of diseases of the heart and to review the subject for younger graduates. Other instalments will follow until completion. If there is a demand for similar treatises on other systems of the body they will be forthcoming.

Slowly progressive dyspnea is first noticed, followed considerably later by daily edema of the ankles and finally by permanent and progressive edema, with all of the symptoms of congestive failure. Precordial aching or palpitation of the heart may be complained of, and occasionally in older patients angina pectoris may occur. Cardiac asthma is sometimes a feature. Weakness is not a common symptom. Nervousness and neurocirculatory asthenia may complicate the clinical picture.

Cardiac enlargement is the only constant sign. Apical and basal systolic murmurs are common in advanced cases. Rarely a diastolic aortic murmur may occur due to dilatation of the aortic orifice. The aortic second sound is often accentuated but not necessarily. Arrhythmias, most commonly premature contractions and auricular fibrillation, may appear. Gallop rhythm and pulsus alternans occur late in some cases when dilatation is advanced.

The blood pressure often remains high until just before death, but occasionally it drops to normal in the early stage of congestive failure.

The ocular fundi almost always show definite signs of long-standing hypertension even though the blood pressure may have dropped to normal.

Roentgenographic studies reveal enlargement of the heart of left ventricular type and often dilatation or elongation of the aorta and pulmonary congestion.

Electrocardiographic studies frequently show no abnormality except often left axis deviation and sometimes abnormal inversion of T waves and any arrhythmia which may exist.

The presence of albumin, casts and blood cells in the urine may be misleading, but the symptoms and signs of heart failure predominate. In an occasional case renal insufficiency due to renal arteriolar sclerosis may, of course, coexist.

Course and Prognosis.—Hypertensive heart disease is progressive usually over a period of many months or years. Once initiated the patient will die as a result of it unless some infection or other complication of hypertension occurs. When the congestion is advanced the end is usually only months away. Gallop rhythm, pulsus alternans and cardiac asthma are of serious prognostic import. In younger individuals the prognosis of essential hypertension itself is more serious, in the aged less so. Treatment of the heart failure may greatly prolong life, especially when instituted early.

The features of hypertensive heart disease, **in summary** are as follows:

1. Frequently a history of moderately severe or severe hypertension for a long time.
2. Slowly progressive dyspnea on exertion, followed by
3. More or less slowly progressive congestion of the tissues and organs.
4. Cardiac hypertrophy and evidence of cardiac dilatation with or without apical and basal systolic murmurs and various arrhythmias.
5. Usually a high blood pressure; occasionally a normal blood pressure at the time of examination.
6. Evidence of long-standing hypertension in the retinal arterioles.
7. Sometimes cardiac asthma, gallop rhythm and pulsus alternans.

ARTERIOSCLEROTIC HEART DISEASE

Etiology.—This type of heart disease is most common in persons over 50 years of age, but may occur in men between 40 and 50 and occasionally earlier. It is involvement of the coronary arteries, usually the larger ones, which causes the trouble. The coronary arteries may be sclerotic without much or with only slight generalized arterial degeneration. In the aged there is naturally much more extensive arteriosclerosis. The exact cause of coronary arteriosclerosis is unknown, but is probably the same as arteriosclerosis elsewhere. Essential hypertension is responsible for a certain number of the cases.

The disease is common. Males are more frequently affected than females (60 to 40).

Physiological and Pathological Considerations.—When coronary arteriosclerosis reaches an advanced degree reduction of blood supply to the myocardium may make itself felt. Collateral anastomoses may for a long time help to maintain a sufficient myocardial circulation. In fact, severe coronary arteriosclerosis may be found at necropsy in patients who had no symptoms of heart disease.

Sudden demands for greater blood flow through the coronary arteries may cause anginal pain or dyspnea. Sudden occlusion of a main branch, most frequently by a thrombus, may occur and is often very serious. A thrombus may form in the vessel because of roughening of the intima, sluggishness of blood flow and some factor of the blood favoring the formation of a clot. An infarct forms in the myocardium and if the patient survives a scarred area results. If the endocardium is involved in the infarction a mural thrombus may form in the ventricle, from which emboli may be thrown off with some sudden increase in strength of the heart beat. If the pericardium is involved a localized fibrinous pericarditis may result.

The most common sites of thrombus formation are the anterior descending branch of the left coronary artery near its origin and the circumflex branch of the right, the former being the more common. Thrombosis of the anterior descending branch causes infarction in the lower anterior portion of the left ventricle and the anterior part of the interventricular septum. Thrombosis of the circumflex branch of the right vessel causes infarction in the upper posterior portion of the left ventricle. Infarcts in the auricles and right ventricle are rare. An infarct may rupture before it can heal, causing death by cardiac tamponade from hemorrhage into the pericardial sac.

Cardiac hypertrophy rarely occurs in uncomplicated coronary arteriosclerosis. After the healing of a large infarct some enlargement may occur. A cardiac aneurism may result from the healing of a large infarct. The myocardium often shows fibrosis, diffuse or more or less localized.

Symptoms and Signs.—The clinical manifestations of coronary arteriosclerosis may be classified for practical purposes as follows:

1. Angina pectoris.
2. Paroxysmal dyspnea or attacks of cardiac asthma.
3. Coronary thrombosis.
   (a) With recovery and reduced cardiac reserve,
   (b) followed by congestive failure, or
   (c) followed by death due to asystole, acute dilatation or rupture of the heart.

Angina pectoris has been described under the heading of anginal failure. The main features are as follows:

1. Sudden substernal pain or oppression, frequently with radiation down the arms, usually the left.
2. Inauguration of the attack by exertion, emotion or overeating.
3. Duration of a few seconds to a half hour.
4. Absence of collapse, change in blood pressure except for a slight rise, or alteration in pulse rate.
5. Relief by cessation of the causative factor or by means of a vasodilating drug, such as amyl nitrite by inhalation or nitroglycerin under the tongue.

Dyspnea is not a feature of angina pectoris, but paroxysmal dyspnea or attacks of cardiac asthma are not uncommon manifestations of coronary arteriosclerosis. These attacks are frequently nocturnal and may be slightly relieved by vasodilating drugs. Some dyspnea on exertion may be noted. Palpitation is sometimes complained of.

Coronary thrombosis is the most serious complication or result of coronary arteriosclerosis. Occlusion of small branches may produce little disturbance, perhaps some pain or only sudden dyspnea and some weakness. With thrombosis of larger branches more serious symptoms develop, as follows:

1. Severe substernal pain, often with epigas-

tric oppression, lasting frequently for hours and not relieved by vasodilating drugs but somewhat by morphine.

2. Collapse, with ashen color of the skin and perhaps cyanosis.
3. Marked fall in blood pressure.
4. Tachycardia.
5. Sudden enlargement of the heart with muffled heart sounds and perhaps a pericardial friction rub for a few days.
6. Various arrhythmias, mainly premature beats and auricular fibrillation, sometimes heart block, none of which need be present.
7. Moderate fever, beginning after about 24 hours and lasting a variable number of days.
8. Moderate polymorphonuclear leukocytosis, usually 10,000 to 15,000, lasting for a few days.
9. Electrocardiographic changes, particularly the "coronary T wave" (v.i.).

The severity and duration of these symptoms and signs depends upon the suddenness of the occlusion, the size of the vessel occluded, the extent of previous damage to the heart and the general condition of the patient.

Murmurs are not characteristic of coronary arteriosclerosis or of coronary thrombosis. Apical or basal systolic murmurs may be present.

If anginal attacks preceded the thrombosis they may disappear for a while, but they frequently return. Sometimes a series of anginal attacks precede thrombosis.

Cardiac hypertrophy may develop subsequent to an attack of coronary thrombosis.

Roentgenography offers little in diagnosis of this condition.

Course and Prognosis.—Coronary arteriosclerosis may exist subclinically for years and never produce trouble. Symptoms may be present in mild form for a long time and coronary thrombosis occur, or coronary thrombosis may appear suddenly without previous warning.

Coronary thrombosis is always of serious import. Many patients survive the first attack and some live for years thereafter. Others die almost immediately or in a few hours or days. Coronary occlusion is the commonest cause of sudden death. It is the "acute indigestion" of newspaper accounts. The patient may live for a few days and develop congestive failure. Acute, fatal cardiac rupture occasionally occurs in 10 to 14 days, at a time when the infarct is softest. If the patient survives an attack of coronary thrombosis the symptoms subside in a few days or weeks, and a return practically to the pre-existing status may occur. Often there is diminished cardiac reserve.

Death may occur suddenly even when a thrombus does not form. An attack of angina pectoris or cardiac asthma may prove fatal.

Altogether, the prognosis in coronary arteriosclerosis is dependent upon the circumstances attending the individual case, but in general it is serious.

RHEUMATIC HEART DISEASE

Etiology.—Rheumatic fever and consequently rheumatic heart disease are most prevalent in settled areas of the temperate zone. In this country they are most common in New England. Although a history of rheumatic fever or chorea can be obtained in only about two-thirds of the cases designated rheumatic heart disease there is no reasonable doubt that most of the other one-third are due to a rheumatic infection.

The cause of the rheumatic infection is probably bacterial, possibly streptococcal. There is some indication that there is no specific organism, however, but a group of organisms, any one of which under favorable conditions may cause the disease. The most likely portal of entry is the throat and probably mainly the tonsils.

Besides rheumatic fever and chorea, acute tonsillitis, "growing pains," repeated epistaxis and febrile illnesses of unexplained nature may be manifestations of rheumatic infection in childhood.

Females are apparently more often affected than males (4 to 3). The age period of predilection is 5 to 15 years. Several members of a family may be affected. Epidemics have been reported. Crowded and unsanitary living conditions favor the occurrence of rheumatic heart disease.

Physiological and Pathological Considerations.—In a great percentage of cases of definite rheumatic infection the heart is involved, but rheumatic fever is a systemic disease with widespread lesions and allergic manifestations, of which those in the heart are the most important. The invasion of the heart may be a pancarditis, with pericarditis, myocarditis and endocarditis. Occasionally the patient succumbs to the acute infectious process in the heart. Usually, however, the pericarditis and myocarditis are minor features and resolve completely. The endocarditis in healing leaves a scarred valve, the amount of scarring depending upon the severity and extent of the endocarditis.

The lesions of the myocardium in the acute stages are the Aschoff bodies, inflammatory groups of small, round mononuclear cells with a few giant cells along the arterioles of the myocardium. These lesions may occur elsewhere in the body. The acute valvulitis is marked by rows of tiny fibrinous vegetations (veruccae) mainly along the line of closure of the valve. The adjacent endocardium and the chordae tendineae may also be involved.

The valve most frequently affected is the mitral valve alone (62 per cent). Involvement of the mitral and aortic together is next most common (33 per cent). Simple aortic endocarditis occurs in perhaps 5 per cent. The other valves are infrequently affected.

Involvement of the mitral valve usually leads to more stenosis than regurgitation, the degree varying from very slight to very severe, due to contraction of the scar tissue. The edges of the valves often become fused, and the left auriculoventricular orifice becomes a funnel or a diaphragm with a small opening, frequently resembling a buttonhole or a fish mouth. The scarred valve is firm, rigid and sometimes calcified. Occasionally the valvular damage is slight, but owing to thickening and contraction of the chordae tendineae pulling the valve down into the left ventricular chamber, stenosis is very slight, if any, whereas regurgitation is prominent.

Predominant stenosis throws the greatest strain upon the left auricle and the right ventricle, the former becoming hypertrophied and dilated, the latter at first hypertrophied and later dilated. Later the right auricle may become hypertrophied and dilated. These alterations are due to the facts that the obstruction at the mitral orifice causes stasis in the pulmonary veins which must be overcome by increased activity of the right ventricle; more blood enters the left auricle than can leave it; and finally when the right ventricle weakens and dilates, tricuspid regurgitation produces distention of, and strain on the right auricle. The left ventricle is usually relatively unaffected, unless regurgitation is the chief defect, in which case it also becomes hypertrophied and dilated since it must expel a greater quantity of blood at each beat to compensate for that lost by regurgitation. The degree of hypertrophy and dilatation of each chamber of the heart depends naturally upon the absolute degree of valvular defect but also upon the relative amounts of stenosis and regurgitation. Auricular fibrillation is very common in mitral disease, but it occurs mainly in adults and most frequently in the late stages, due perhaps to dilatation of the left auricle or both auricles.

The heart fails in chronic mitral disease because of the mechanical burden upon the myocardium and not from actual myocardial disease, but recurrence of the rheumatic infection may exaggerate or precipitate failure. From time to time pulmonary congestion may become markedly increased, with dyspnea and sometimes hemoptysis. Occasionally there may be some evident congestion of the liver and edema of the ankles, but proper treatment may restore compensation for months or years. Eventually progressive congestive failure ensues.

When the aortic valve alone is involved the same results occur. Fusion of the valve edges, thickening from fibrosis or calcification and the resultant deformity cause stenosis and regurgitation, the regurgitation usually predominating in the case of the aortic valve. Marked aortic regurgitation has a much more serious effect than has marked aortic stenosis. The wall of the left ventricle becomes greatly hypertrophied and its chamber dilated and smooth-walled, because when the ventricle contracts it must expel more blood more forcibly to compensate for the leak. When it weakens and dilates too much the mitral valve is stretched and becomes insufficient, after which the same series of events transpires as with mitral valve disease, although death may occur before the full development of all stages. Because of the increased force of each heart beat in aortic regurgitation the systolic blood pressure is somewhat elevated; and on account of the overdistention of the arteries followed quickly by their collapse because the blood leaves them in both directions, the diastolic blood pressure is low. As a consequence of this low diastolic pressure, blood flow through the coronary arteries may be diminished and its reserve capacity decreased therefore. When aortic stenosis predominates the wall of the left ventricle hypertrophies, but dilatation does not occur until the ventricle fails. The systolic blood pressure is low and the pulse pressure small. Auricular fibrillation is rare with aortic disease.

Tricuspid and pulmonary valvular disease of rheumatic origin are so unimportant clinically that they will not be discussed. From the foregoing remarks upon mitral and aortic endocarditis one may readily picture the effects of similar involvement of the other valves.

The commonest combinations of valvular lesions are mitral and aortic, and mitral and tricuspid. The strain upon the heart is naturally greater. When the mitral and aortic valves are simultaneously affected, in about three-fourths of the cases the mitral lesion is the more important one, whereas in the other one-fourth the aortic lesion is the chief one.

Symptoms and Signs.—The symptoms of rheumatic heart disease depend upon 4 factors:

1. The activity of the rheumatic infection,
2. the site and degree of valvular damage,
3. the presence and severity of heart failure,
4. complications.

1. After the initial infection has subsided there may be no symptoms for years, and even the original episode of invasion may not have been noted. On the other hand, in young children the original infection may be fatal. Children are more prone to longer periods of active infection, lasting for weeks, months or even years, usually of a low grade nature. There may be some weakness, pallor and loss of weight and daily or frequent elevation of temperature, often not above 100°F. In adults the joint manifestations are usually more prominent and the infectious stage shorter and more severe. When infection is present there may be some precordial aching and infrequently an arrhythmia, such as premature beats and paroxysmal tachycardia. In young children, when the infection is overwhelming there is some dyspnea, a rapid pulse rate, enlargement of the area of cardiac pulsation and dullness, and loud systolic or systolic and diastolic murmurs.

From time to time evidences of recurrence of infection may exist with perhaps some joint pains, malaise, a little fever and tachycardia.

Rheumatic nodules indicate severe infection. These are round nodules, about 1 to 5 mm. in diameter, attached loosely to tendons, periosteum or joint capsule, located usually bilaterally and symmetrically on the head or extremities. Erythema multiforme, purpura, erythema nodosum, urticaria and angioneurotic edema may occur. Acute pleuritis and acute pericarditis may denote activity. Moderate leukocytosis and albuminuria are common.

2. There may be well marked evidence of a particular valvular lesion or lesions, or there may be only a systolic, blowing murmur at the apex and perhaps a slight cardiac enlargement. The physical signs of distinct valvular lesions are as follows:

Mitral Stenosis:

1. A soft blowing or rumbling apical murmur in the middiastolic phase of the heart beat, with or without presystolic accentuation, without extensive radiation. This murmur may not be audible during auricular fibrillation. It varies in intensity also from time to time. In general it is more marked after exertion. It is pathognomonic.

2. Often a sharp snapping first heart sound at the apex, usually in association with the murmur, which seems to end in the first sound.
3. Often accentuation and perhaps reduplication of the second pulmonic sound.
4. Sometimes a diastolic thrill at the apex.
5. Apex beat in normal position, but evidence on percussion of enlargement of the left auricle.

Mitral Regurgitation:

1. An apical systolic murmur which is often transmitted laterally toward and often into the axilla and medially toward the sternum. The murmur is least intense with the greatest degree of regurgitation.
2. Often accentuation and perhaps reduplication of the second pulmonic sound.
3. Evidence of some degree of hypertrophy and dilatation of the left ventricle and auricle.

Aortic Regurgitation:

1. An early, blowing diastolic murmur heard maximally along the left border of the sternum, over the sternum at the level of the second and third ribs, and in the aortic area (second intercostal space to right of sternum).
2. Often a systolic murmur in the aortic area.
3. Evidence of enlargement of the heart downward and to the left.
4. A collapsing pulse (Corrigan's water hammer pulse), due to overdistention and sudden collapse of the vessel, elicited best by holding the arm vertically upward.
5. A double murmur in the great vessels when compressed (Duroziez's sign).
6. Visible capillary pulsation, elicited best by scratching the forehead or holding a glass slide against the lips.
7. A large pulse pressure, due largely to a low diastolic pressure (often 30–40 mm. Hg.) and partly to a slight or moderate elevation of the systolic pressure. If mitral stenosis is associated the pulse pressure and peripheral signs may not be so great.

Aortic Stenosis:

1. A loud systolic murmur in the aortic area transmitted upward and toward the arms along the large arteries.
2. Often a thrill in the aortic area.
3. Diminution or absence of the second aortic sound.
4. Evidence of moderate cardiac enlargement (moderate because there is little or no dilatation until failure occurs).
5. A slow, small pulse.
6. A low systolic and small pulse pressure.

A combination of regurgitation and stenosis of the mitral valve gives signs of both lesions, usually midway between the extreme signs of the individual defects.

In chronic valvular disease without congestive failure there may be symptoms of neurocirculatory asthenia or cardiac neurosis (v. i.), such as palpitation of the heart, excessive tachycardia and dyspnea on exertion and easy fatigability.

The roentgenographic study shows a bulge in the region of the left auricle and enlargement of the right ventricle in mitral stenosis, enlargement also of the left ventricle in predominant mitral regurgitation, enlargement and elongation of the left ventricle in aortic regurgitation and more moderate enlargement with a rounder contour of the left ventricle in aortic stenosis.

The electrocardiogram may show prolongation of conduction time between auricles and ventricles (P-R interval over 0.20 seconds) during the acute rheumatic infection, or there may be even dropped beats or higher grades of A-V block. During the chronic stages there may be no deformity except perhaps right axis deviation in mitral disease with exaggerated P waves, and left axis deviation in aortic disease. The arrhythmias, mainly auricular fibrillation and premature beats, are shown.

3. When congestive failure sets in the usual train of symptoms and signs already described occurs. Minor attacks may take place from time to time and be recovered from.

4. The main complications of rheumatic heart disease are recurrence of infection and congestive

failure, previously discussed. Auricular fibrillation may be considered also an important complication since it occurs sooner or later in about two-thirds of cases of marked mitral stenosis. Subacute bacterial endocarditis (v. i.), while not exactly a common disease, occurs most often in cases of chronic valvular disease, showing a predilection for the damaged aortic valve and for the mitral valve, the main defect of which is regurgitation. Embolic phenomena are not common in chronic valvular disease except when congestive failure or auricular fibrillation are present, when pieces of thrombi in the auricular appendages may be thrown off, or when subacute bacterial endocarditis has developed with its crumbly vegetations. During a recurrence of infection acute pericarditis, often with effusion, may occur, with recovery. Adhesive pericarditis may result, but usually it does not cause much trouble.

Course and Prognosis.—The earlier in life the heart becomes affected the more serious the prognosis. The first infectious invasion is usually survived. It may be mild and last a long time, but the heart is usually badly crippled. Recurrences of the infection may occur with augmentation of cardiac damage, and death result in one of them from toxemia or heart failure. Often the individual reaches adult life, but auricular fibrillation, congestive failure or subacute bacterial endocarditis may occur at any time. Death usually occurs in the third, fourth or fifth decade after 10 to 20 years of partial crippling and after 2 to 5 years of more or less complete invalidism. If the lesion is slight the patient may live to old age and die of heart failure or something else. Slight degrees of mitral regurgitation, aortic regurgitation, aortic stenosis or adhesive pericarditis are well borne. The average age of death with severe mitral lesions is 30 years, with severe aortic lesions 45 years and with lesions of both valves 30 years.

(*To be continued*)

ABSTRACT

"Congenital Stenosis of the Larynx. Report of a Case,"* by **Richard W. Wilkinson, M.D.**

Congenital stenosis of the larynx is a comparatively rare condition. Not more than 12 cases have been recorded in the literature within the past decade. True congenital stenosis is limited to atresia, bands or webs occurring within the glottis, involving the vocal cords, ventricular bands, or the arytenoids and is permanent unless relieved by some surgical method. The most frequent lesion is a web or band situated at the anterior commissure which may extend beyond the middle of the glottis. The atresic type is very rare and usually incompatible with life. The case which is reported in this paper is of the atresic type. Many theories have been advanced as to the etiology of this condition. Heredity and congenital syphilis have been blamed but evidence offers little support. The embryologic fusion theory is the most tenable and is generally accepted. Embryologically there is a period of fusion of the structures of the glottis, apparently a provision on the part of nature to prevent the passage of amniotic fluid down the respiratory tract. Later, about the eleventh week, there is a period of dissolution at which time the arytenoid folds or swellings separate, followed by parting of the superior and inferior folds to form the ventricular bands and vocal cords proper, and thus gradually the open glottis which we see at birth is formed. When stenosis occurs, it is the result of incomplete separation of the fusion process and there remains a web or band which may be of variable thickness. The symptoms depend upon the impairment of laryngeal function. Small bands may cause little or no disturbance of respiration or phonation. Greater degrees of closure result in respiratory and vocal difficulties of a serious nature. The diagnosis is made by direct laryngoscopy in the young and by direct or indirect methods in older subjects. The treatment depends entirely upon the severity of the stenosis. In cases with no dyspnea little need be done. Webs are incised along one cord only and allowed to flap down, thus preventing adhesions during the healing process. Bands are excised or removed with punch forceps. Where the cords themselves are adherent, they are separated by a median incision. Repeated bougienage is usually employed following any of these operative procedures, since adhesions are very prone to form.

(*Continued on page 304*)

---

* Paper read before the Section on Ophthalmology and Oto-Laryngology of the Medical Society of the District of Columbia, October 20, 1933.

MEDICAL ANNALS
of the
DISTRICT OF COLUMBIA
Editorial Office, 1718 M Street

EDITORIAL STAFF
COURSEN B. CONKLIN, A.M., M.D., *Managing Editor*
WALLACE M. YATER, A.B., M.D., M.S., *Editor*

Committee on Publication
WALLACE M. YATER, A.B., M.D., M.S., Chairman
JAMES W. ESLER, A.B., M.D. C. R. L. HALLEY, A.B., M.D.
F. R. SANDERSON, M.S., M.D. MATTHEW WHITE PERRY, B.S., M.D.

Subscription $2.00 per year Single Copies, 25¢

ECONOMIC QUACKERY

In reviewing the minutes of the Society for the past 25 years, many items for discussion are noted which would have a direct bearing on the economic position of the Doctor. The patent and proprietary medicine problem,[1] the various and sundry types of irregulars and quacks[2] who were and are preying on the local population as well as making inroads on the legitimate income of the Doctor, the matter of dispensary abuse[3,4] which has for a long time been with us, and the more recently emphasized matter of the hospitals practicing medicine,[5] all have been given serious consideration, but at no time previously have we heard the expressions now almost trite: "the profession is at the crossroads," "state medicine," "socialization of medicine." What with worn out debaters on "costs of medical care, majority and minority committee reports," and such problems as the Milbank Fund and its distribution, and with the ever increasing imbalance of the number of medical graduates to the number of dying physicians, the depression-conscious minds in the profession have been seriously occupied and we believe about made ready for the acceptance of almost anything showing a way out; regretfully, we say, even though the plan be promulgated by none too scrupulous laymen.

The crux of the present situation is plainly that the medical practitioners, along with other professions and occupations in the industrial world, have suffered sharp cuts in income during the past 4 years. Patients who formerly did not hesitate to comply with requests for payment "for services rendered," have about ceased compliance. This reluctance has actually been in a greater degree than that on the response to bills "for goods received." In Washington, Government clerks, who make up the larger part of the local doctors' clientele, received a 15 per cent cut and then other reductions. Many were uncertain of the future. The physician finds inability to meet overhead for office, laboratories, office personnel and even household necessities. Practitioners on a partial salary basis or even occupying a whole-time job, who in times of plenty were in the lower income brackets among the profession, were now seen to be better off financially. What more natural than to find certain thinking members attempting to get emoluments from insurance clinics and even contract practice, a guaranteed income? What more to be expected than to find competition most keen in maintaining these emoluments? A corrollary is the entrance of many able doctors into the twilight zone of medical ethics.

There is no diminution during times of depression of disease incidence, scarlet fever, measles, heart disease, appendicitis, and even with all the assaults of a knowing public, babies are still being born. The demand for good medical service remains unchanged. Laymen seize the opportunity afforded by the general depressed financial conditions on the one hand and the reaction of the physician to difficulties encountered in obtaining returns "for services rendered," in organizing clinics, placing physicians on a payroll with time clock and other regimentation. Much is said about health insurance under governmental auspices or otherwise. The advantages to the profession are painted in glowing terms, with ready acceptance by certain benighted Doctors.

---

[1] History, Medical Society of the District of Columbia, 1909, p. 47.

[2] History, Medical Society of the District of Columbia, 1909, p. 201.

[3] Report of Committee on Abuse of Medical Charity, Dr. J. A. Gannon, Chairman, May 4, 1921.

[4] Report of Committee on Abuse of Medical Charity, Dr. H. A. Ong, Chairman, January 4, 1922.

[5] Minutes of Society, April 2, 1930.

Many of our present problems with their investigations have existed before, but perhaps not under similar stress. In these days the profession has suffered not a 15 per cent reduction in income but one of 50 per cent and more. As bad as it has been we believe in a recovery and at least a partial return to the time-proven merits of former professional status. In any event, patient reviewing of facts and calm thought without semblance of stampede, meanwhile offering the very best medical service for all, are necessary; then, if some of the structure of medical practice needs changing with an incoming new era, the public and the profession will be more assured of an equitable adjustment. Above all, let us beware of any tinkering in this connection by any agency outside of the medical profession, be it governmental or otherwise. Let us follow the sound advice of Dr. R. G. Leland,[6] Director, Bureau of Medical Economics of the American Medical Association, implied in the following:

"Economic quackery in its relation to medicine flourishes best during periods of social and economic stress. During such periods the tendency to establish unsound and dangerous methods of administering medical care is greatest. It should be obvious, therefore, that all proposals to change medical practice during troublesome times must be subjected to the most searching examination, in order that the time proven principles of medicine shall not be destroyed."

THE ACTIVITIES OF THE COMMITTEE ON MEDICAL ECONOMICS

Dr. Thomas A. Groover, *Chairman*

The work of the Committee on Medical Economics has gotten well under way. The problems with which it is concerned are intricate. Many of them can not be intelligently approached without first collecting considerable data. This will take time, the expenditure of some money, and the coöperation of individual members and groups of members of the Society. It is hoped and believed that much good will eventuate from these studies and conferences apart from any concrete recommendations and action that may grow out of them. We need to put our own house in better order by a re-affirmation of allegiance to the time honored principles of medical ethics, and there is already evidence that something is being accomplished in that direction without having to resort to disagreeable or drastic procedures.

Group Hospitalization

The Committee has taken definite action in regard to one matter in which every member of the Society should feel a keen interest, namely, the tentative endorsement of plans for group hospitalization subject to certain amendments recommended by the Committee. Later on when the plan has assumed a definite form it is expected that it will be submitted to the Society for their endorsement. Meanwhile members should thoroughly familiarize themselves with the general aspects of the subject by studying the article published in The Medical Annals, April, 1933, under the caption "Group Hospitalization Plans for People with Limited Incomes."[7] In this connection it would be well to keep in mind that it is not simply a question as to whether or not we believe that any plan for group hospitalization will accomplish all that is claimed for it. The fact of the matter is that group hospitalization is already here in a form which according to the evidence available is highly inimical to the interests of the medical profession as a whole. Would it not be better to back a plan that safeguards their interests even though we may believe it to be defective in other respects?

Newly added personnel to the Committee on Medical Economics are the following:

---

[6] West Virginia Medical Journal, 29, 523.

Harry S. Bernton
Robert M. Bolton
James A. Cahill, Jr.
Arthur C. Christie
Harry A. Fowler
Ralph M. LeComte
Francis J. Ready
Prentiss Willson

MEDICAL SOCIETIES WITH LIMITED MEMBERSHIP

Washington Gynecological Society

An organization composed of obstetricians and gynecologists has recently been formed under the name of The Washington Gynecological Society. At the Mayflower Hotel on the evening of November 25, 1933, was held the first dinner meeting, with Dr. George W. Kosmak of New York, Editor of the American Journal of Obstetrics and Gynecology, as the guest speaker. The President, Dr. Howard F. Kane, in his address, outlined the steps taken during the past summer toward organization. The opportunity afforded by the Society for the discussion of the purely technical side of their specialty was stressed.

Four classes of Fellows constitute the membership: active, associate, life, and honorary. An Active Fellow must be licensed in the District of Columbia, must be a member of the Medical Society of the District of Columbia, must have been in practice at least 10 years, and at least 75 per cent of his work must be in the field of obstetrics and gynecology. It should be noted that the policies of the Society are in the hands of this group as they alone are privileged to vote and hold office.

An Associate Fellow must have been in practice at least 3 years and must make obstetrics and gynecology a prominent part of his work. Associate Fellows must participate fully in the social and scientific activities of the Society.

Life Fellows: Active Fellows may, at the end of 10 years, and must at the end of 15 years or upon attaining the age of 60, become Life Fellows. As such they are exempt from dues and attendance requirements, may not vote or hold office, but may attend and take part in all meetings.

Honorary Fellows are practitioners of the specialty whose eminence has earned for them the privileges of Fellowship with none of responsibilities.

Meetings of the Society, preceded by a dinner, are to be held on the fourth Saturdays of October, November, January, March and May.

Dr. Kosmak extended greetings from the New York City Obstetrical Society. He mentioned the tendency of the modern medical school to combine in one professorial chair the specialty of gynecology and obstetrics. Upon conclusion of his well received address he was informed of his election to Honorary Fellowship. In the absence of Dr. Prentiss Willson, Dr. Harry A. Fowler, Past-President offered the felicitations of the Medical Society of the District of Columbia. Dr. A. B. Bennett, President of the George Washington University Medical Society and Dr. Joseph F. Elward, President of the Georgetown Clinical Society extended cordial greetings from their respective bodies.

The Society's roster follows:

President, Howard F. Kane; *1st Vice President*, Leon A. Martel; *2nd Vice President*, E. W. Titus; *Secretary*, Herbert P. Ramsey; *Treasurer*, Radford Brown; *Historian*, Jerome F. Crowley; *Council:* Prentiss Willson, Joseph J. Mundell, J. Lewis Riggles, Henry L. Darner.

Honorary Fellows: W. Sinclair Bowen, A. Y. P. Garnett, Virgil B. Jackson, J. Thomas Kelley, Jr., George W. Kosmak, Huron W. Lawson, G. Brown Miller, William M. Sprigg, Albert L. Stavely, Isaac S. Stone.

Active Fellows: Radford Brown, Jerome F. Crowley, William J. Cusack, Henry L. Darner, Joseph Harris, Roy F. Higgins, J. Bay Jacobs, Helen Gladys Kain, Howard F. Kane, Jacob Kotz, Thomas F. Lowe, Leon A. Martel, Joseph J. Mundell, George Nordlinger, Albert E. Pagan, Herbert P. Ramsey, J. Lewis Riggles, Richard L. Silvester, William J. Stanton, Robert Y. Sullivan, E. W. Titus, Prentiss Willson, John W. Warner.

Associate Fellows: L. Lee Cockerille, James R. Costello, Samuel M. Dodek, Edmund M. Ellerson, George J. Ellis, Preston Haynes, Clayton H. Hixson, Raymond T. Holden, Jr., David H. Kuschner, John J. Lynch, Joseph M. McHale, H. J. Russell McNitt, Esther A. Nathanson, Bernard Notes, Howard P. Parker, Alec A. Preece, W. Raymond Thomas, John D. Wynkoop.

Centenary of the Birth of Dr. Carlos Finlay

On the evening of December 3, 1933, under the auspices of the Washington Chapter of the Pan-American Medical Association, at the Cuban Embassy, the centennial of the birth of Dr. Carlos Finlay was commemorated. Senor Dr. Manuel Marquez Sterling, Cuban Ambassador, expressed the gratitude of the Cuban government to Dr. Finlay for his work in the discovery of the mode of transmission of yellow fever. This meeting was notable by the presence of Dr. John O. McReynolds, president of the Pan-American Medical Association, who extended the greetings from 24 countries represented in the Association. Other speakers were: Colonel Roger Brooke of the Army Medical Department; Senor Don Luis M. de Irujo, Charge d'Affaires of the Spanish Embassy; Drs. L. O. Howard and Victor Alfaro, Brigadier General J. R. Kean, and Surgeon General Hugh S. Cumming, who is President of the local chapter of the Pan-American Medical Association. Words of appreciation from the late Dr. Finlay's son, George H. Finlay, a New York civil engineer, concluded the ceremonies.

The George M. Kober Medical Society

The annual Christmas party given by the George M. Kober Medical Society was held this year at the Shoreham Hotel, on the evening of December 16. This event is looked forward to with a great deal of anticipation by the members, as on this evening the Society acts as host to its members, their wives, and invited guests. The party, a dinner dance for which reservations were made early in the Fall was most enjoyable. Unusual favors for the ladies were presented. The Committee on Arrangements: Herbert H. Schoenfeld, Chairman; W. Preston Haynes and Don S. Knowlton.

DOCTOR JOBLING ADDRESSES G. W. U. STUDENTS

The November lecture on the Smith-Reed-Russell series at the George Washington University School of Medicine was delivered by Professor James W. Jobling, Professor and Executive Officer of the Department of Pathology, College of Physicians and Surgeons, Columbia University, New York City. Dr. Jobling spoke on "Arteriosclerosis."

INTERURBAN SOCIETY MEETINGS

JOINT MEETING, OPHTHALMOLOGICAL AND OTO-LARYNGOLOGICAL SECTIONS OF THE BALTIMORE CITY MEDICAL SOCIETY AND THE MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA

On the evening of December 7, in the lecture hall, Wilmer Institute, Johns Hopkins Hospital, with Dr. Benjamin Rones presiding, the following program was presented:

1. "Demonstration of Old Spectacles." Dr. William H. Wilmer.
2. "A New Physiological Method for the Study of the Ear." Dr. Samuel Crowe.
3. "Blue Sclerotics and Brittle Bones." Dr. Joseph Desoff.
4. "Membranous Conjunctivitis Associated with Pansinusitis. Case Report." Dr. Alan Woods.

Dr. John W. Burke, of Washington, opened the discussion.

The Secretaries of the respective sections are:
Baltimore—William M. Rowland, M.D.
Burdelle S. Cannon, M.D.
Washington—Harry F. Davies, M.D.

BALTIMORE-WASHINGTON UROLOGICAL SOCIETY

This Society furnished the program for the regular meeting of the Medical Society of the District of Columbia on Wednesday evening, December 13, 1933. The program:

1. "Scrotal Masses Simulating Testicular Tumors. Report of Cases." Dr. Austin H. Wood, Baltimore.
2. "Observations on the Treatment of Hypernephroma by Surgery and X-ray." Dr. Lawrence P. Wharton, Baltimore.
3. "Primary Tumor of the Ureter. Technique of Complete Ureteronephrectomy." Dr. J. A. C. Colston, Baltimore.
4. "Rupture of Urinary Bladder Resulting from Fulguration of a Protruding Intravesical Vermiform Appendix." Dr. A. E. Goldstein, Baltimore.

A dinner at the Mayflower Hotel with transaction of the business for the fifth annual meeting preceded the scientific program.

Officers of the Society, 1933: H. A. Fowler, President; A. E. Goldstein, Vice President; Charles P. Howze, Secretary.

AMERICAN PSYCHOANALYTIC ASSOCIATION

A Federation of the American Psychoanalytic Societies will hold its midwinter meeting at the Shoreham Hotel on December 26 and 27, 1933. The Washington-Baltimore Psychoanalytic Society will be host to the convention. The preliminary list of speakers include Drs. Franz Alexander, Karen Horney, Herman Nunberg, Sandor Rádo, Bernard S. Robbins and Clara Thompson. Dr. Alexander will present a symposium on "The Research Work in Gastrointestinal Disorders being Conducted at the Chicago Psychoanalytic Institute." Dr. Rádo will act as moderator at a Round Table, the subject for which is "The Influence of Masturbation Upon the Neuroses." All physicians are welcome to attend the scientific programs of the Association.

SCIENTIFIC EXHIBIT, CLEVELAND SESSION, A. M. A.

Application blanks are now available for space in the scientific exhibit at the Cleveland Session of the American Medical Association, June 11 to 15, 1934. The Committee on Scientific Exhibit requires that all applicants fill out the regular application form and requests that this be done as early as convenient. The final date for filing applications is February 26, 1934. Any person desiring an application blank should address a request to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

Noble Price Barnes, M.D., (1871–1933) past president of the Medical Association of the District of Columbia, died on November 26, 1933. In addition to meeting the demands of a large practice, he was noted as a medical educator and held a place of prominence in both local and national medical organizations. He occupied the chair of pediatrics in the National

Medical College, which later merged with the George Washington University Medical School. He taught materia medica both in the George Washington University Dental School and the George Washington University Medical Department. Of the national organizations with which he was connected, the American Therapeutic Society was one in which he was most active, having been secretary, president, and for a long time on the Board of Governors. He was foremost among the national professional groups that were successful in developing the American College of Physicians. He was an organizer of the Washington Medical and Surgical Society and served as president a number of terms.

NOBLE PRICE BARNES, M.D.
1871–1933

Dr. Barnes was Chairman of the Section on Internal Medicine of the Medical Society of the District of Columbia and an ex officio member of the Executive Committee in 1926, a member of the Library Committee in 1928, and delegate to the United States Pharmacopeia Convention in 1930. He became a member of the Medical Association of the District of Columbia on October 3, 1895, and of the Medical Society of the District of Columbia on April 7, 1897, His Medical Society seniority number was 179.

Dr. Barnes is survived by his widow, Mrs. Helen M. Barnes, and a son, Dr. John M. Barnes, a resident of Buffalo, N. Y., and an associate member of this Society.

His generous spirit and geniality will be missed by all with whom he came in contact.

Emmett Emerson Newcomer, M.D., (1892–1933) died November 25, 1933. He became a member of the Medical Society of the District of Columbia on March 2, 1927. His seniority number was 960. He had served on the house staff at Garfield Memorial Hospital and was active in the work of his specialty, urology.

REPRINTS RECEIVED

The following reprints have recently been received for which due acknowledgment is made:

"Report of the Committee on the Costs of Medical Care. Its Significance to the Medical Profession," California and Western Medicine, May, 1933, by Arthur C. Christie, M.D.

"The Diagnostic Value of the X-ray in Certain Intrathoracic Diseases: Pleural Effusions, Bronchiectasis, and Atelectasis," Southern Medical Journal, January, 1933, by Arthur C. Christie, M.D.

"The Roentgen Findings in Chronic Progressive Bulbar Palsy," American Journal of Roentgenology and Radium Therapy, May, 1932, by Arthur C. Christie, M.D.

"Diverticula of the Male Urethra," Journal of Urology, October, 1933, by R. M. LeComte, M.D., and M. J. Herschman, M.D.

"Etiology and Pathogenesis of Renal Infections," Southern Medical Journal, July, 1933, by R. M. LeComte, M.D.

"The Rôle of the Roentgen Ray in Determining the Cause of Gastro-intestinal Bleeding," Southern Medical Journal, March, 1932, by Edgar M. McPeak, M.D.

"Physical Therapy in Gastro-intestinal Conditions," Principles and Practice of Physical Therapy, Volume I, Chapter XXI, W. F. Prior Company, Inc., by William Gerry Morgan, M.D., and Oscar L. Hite, M.D.

"The Reticulo-Endothelial System and Its Relation to the Roentgen Study of the Liver and Spleen after the Intravenous Administration of Thorium Dioxide Solution," Radiology, September, 1932, by L. S. Otell, M.D.

"Effect of Stimulation of Posterior Longitudinal Fasciculus on Ocular Muscles," Archives of Ophthalmology, June, 1933, by Norman P. Scala, M.D., and Ernst A. Spiegel, M.D.

"The Treatment of Essential Hypertension by X-Radiation of the Medulla Oblongata," Southern Medical Journal, July, 1932, by Wallace M. Yater, M.D., Fred O. Coe, M.D., and Isadore Rodis, M.D.

"An Unusual Case of Pleural Effusion Simulating Elevation of the Diaphragm," American Journal of Roentgenology and Radium Therapy, June, 1933, by Wallace M. Yater, M.D., and I. Rodis. M.D.

"Hepatosplenography with Thorium Dioxide Sol. Clinical Experience with 100 Patients," Journal, American Medical Association, August 12, 1933, by Wallace M. Yater, M.D., and Laurence S. Otell, M.D.

"Roentgenographic Demonstration of an Arteriovenous Aneurysm by Means of Thorotrast," American Journal of the Medical Sciences, October, 1933, by Wallace M. Yater, M.D., and Charles Stanley White, M.D.

"Congenital Heart Block. Review and Report of the Second Case of Complete Heart Block Studied by Serial Sections Through the Conduction System," Journal, American Medical Association, June 10, 1933, by Wallace M. Yater, M.D., James A. Lyon, M.D., and Paul E. McNabb, M.D.

"The Differential Diagnosis of Diseases of the Liver and Spleen with the Aid of Roentgenography after the Intravenous Injection of Thorium Dioxide Sol (Thorotrast): Experience with 80 Patients," Annals of Internal Medicine, September, 1933, by Wallace M. Yater, M.D., and Laurence S. Otell, M.D.

"Primary Hemangio-Endothelio-sarcoma of the Liver," Journal, American Medical Association, July 8, 1933, by Charles S. White, M.D.

"Double Primary Malignant Tumors of the Colon," Annals of Surgery, August, 1933, by Charles Stanley White, M.D.

"Relative Depressant Effects of Certain Barbiturates on Heart of Elasmobranchs," Proceedings of the Society for Experimental Biology and Medicine, 1933, p. 563, by George B. Roth, M.D.

"Outline of Medical Physiology. Part III, Respiratory System," by Leslie H. French, M.D., Associate Professor of Clinical Medicine, Georgetown University School of Medicine.

MEDICAL MEETINGS IN THE NEW YEAR

The George M. Kober Medical Society

The program for Monday evening, January 15, 1934, follows:

1. "Amebic Dysentery." Dr. Tomas Cajigas.
2. "The Recognition of Incipient Mental Disorder." Dr. Ernest E. Hadley.

The newly elected officers are:

Tomas Cajigas, *President*
Ernest E. Hadley, *Vice President*
Herbert H. Schoenfeld, *Secretary*
Howard L. Smith, *Treasurer*

George Washington University Post Graduate Clinics

On February 23 and 24, 1934, a series of clinics and demonstrations will be given at Gallinger Municipal Hospital and other institutions. This will be coincident with the annual homecoming of graduates of the George Washington University School of Medicine. A banquet under the auspices of the George Washington University Medical Society will be a feature. A large attendance of out-of-town physicians is expected.

ANNUAL SCIENTIFIC ASSEMBLY

Medical Society of the District of Columbia, May 2–3, 1934

These meetings, with two full days for dry clinics, scientific demonstrations and papers, have been unusually successful. This year they are going to be especially attractive features. If you have a paper you wish to read or a scientific exhibit to present, make contact with the committee now. Committee personnel:

Don S. Knowlton, *Chairman*
William Thornwall Davis, *Attendance*
Arnold McNitt, *Luncheon*
A. B. Bennett, *Halls*
Eugene R. Whitmore, *Exhibits*
Ernest E. Hadley, *Program*
James A. Cahill, Jr., *Surgical Clinics*
Walter A. Bloedorn, *Medical Clinics*
Ivy A. Pelzman, *Finances*
John A. Reed, *Publicity*
Horatio N. Dorman, *Banquet*
Coursen B. Conklin, *Registration*
Robert A. Bier, *Public Meeting*
Guy W. Leadbetter, *Entertainment*
Alma Jane Speer, *Women Physicians*
Daniel L. Borden, *Motion Pictures*
Maurice Protas, *Woman's Auxiliary*

ABSTRACT

(*Continued from page 298*)

Report of Case: S. R., female, aged 7 years, suffered from frequent attacks of dyspnea since birth. She spoke with a whisper that could not be heard further than the distance of a foot. Direct laryngeal examination revealed an atresia of the free borders of the vocal cords anteriorly, reducing the glottis to half its normal size. The remainder of the larynx appeared normal with good movements of the arytenoids and posterior halves of the cords. Under general anesthesia the cords were separated by a median incision, followed by bougienage at later intervals to break down adhesions that formed. The child now has a very slight atresia at the anterior commissure, the incised edges of the cords are a little roughened, the glottis is four-fifths patent. She has a normally audible speaking voice which is slightly husky. She has had no attacks of dyspnea since the first operative procedure.

MEDICAL ANNALS OF THE DISTRICT OF COLUMBIA

VOLUME II, 1933

SUBJECT INDEX

Anemia, pernicious, etiology of, (Daniels) 104
Angina, agranulocytic, and allied conditions, (Jackson) 16-ab
Appendicitis: some observations based on a review of 3,913 operative cases, (Finney) 64-ab
Arteriosclerosis, mesenteric, gastro-intestinal symptom-complex of, (Perry) 187
Barton Bequest, 46
Biography: Antisell, Thomas, 67
  Lives and works of medical men in the District of Columbia, 193
  Osler, Sir William, personal reminiscences of, (Abbott) 192-ab
Book Notices: American Medical Directory, 246
  Diseases of Infants and Children, 276
  Medical Relations Under Workmen's Compensation, 218
  Neuropathy, Text-book of, 246
Cancer: See also Surgery
  breast, evaluation of irradiation in carcinoma of, (Merritt) 238-ab
  neoplastic diseases, constitutional factors in, (Abbe) 219
  rectal, treatment of, (Warfield) 127
  rectum and rectosigmoid, early diagnosis of, (Horgan) 197
Catatonia problem, newer aspects of, (Langenstrass) 122-ab
Contagious Disease: establishing isolation in the private home, (Ellicott) 146
  reports, 46, 98, 246
Davidson Lecture, 45, 69, 121, 217, 245, 247
Diabetes, diets, simplified, for diabetic patients, (Allan and Victor) 23
  mellitus, complications of, (Protas) 233
Diagnosis, logic in, 240
Digitalis, action of, 18
Encephalitis, epidemic: clinical aspects including treatment, (Hohman) 148-ab
  etiology, (McKinley) 148-ab
  pathology, (Freeman) 148-ab
Eye: gonorrheal ophthalmia, results of treatment of, (Cummings) 203
Fever, rheumatic, etiology of, (Hedley) 168
Gold, colloidal, test, with a note on an improved method of making it, (Ashby) 122-ab
Headache, from the standpoint of neurologist, (Schneider) 5
  from the standpoint of rhinologist, (Alexander) 7
Healing Arts Practice Act, 195
  unlicensed practitioners, 216
Heart, diseases of, (Yater) 259, 291
  disease in Washington, D. C., (Gager and Dunn) 112
  disease, pregnancy in, (Daniels) 282
Hernia, scrotal, mammoth inoperable, (Cahill) 137
Hodgkin's Disease: modern concept of lymphadenoma, (Lattman) 231
Hospitals, staff meetings, schedule of, 196
Injections, intravenous, in pediatrics (Bier) 9
  intravenous, in surgery, (Lyons) 32
  intravenous, technic of, (Selinger) 54
Kidney function, urinary volume and specific gravity as indices of, (Leffler) 182
Kober Lecture, 70
Liver: See Thorotrast
Mastoid: See also Surgery
  fistula, cure of, with fat-graft, (Bennett) 117
Medical Calendar, 176, 196, 217
Medical Economics: committee on, 69, 93, 246, 274,
  contract practice, 150
  economic quackery, 299
  free medical service in Washington, 272
  group hospitalization, 93, 300
  high cost of standardization, (Fenning) 177
  National Industrial Recovery Act, 216
  professional unity, 214
Medical Education, changing trend in, 66
  cost of, 244
  practitioner's scientific betterment, 119
Medical Schools: George Washington University, 21, 124, 150, 218, 246, 304
  Georgetown University, 123, 176, 195, 217, 218
Medical Society of the District of Columbia:
  Amendments to Constitution and By-laws: certificates of illness, 20; chairmen of standing committees, 20, 69; committee on public health, 121, 274; medical defense, 20, 69; members by invitation, 20
  Annual meeting and banquet, 70, 96, 120, 304
  Committees: abolishment of, 121, 149; abuse of medical charity and medical clinics, 20, 195; bequests, 194; budget, 194; business affairs, 69, 194; cancer, 121; censors, 174; civic health, 174; Davidson Lecture, 194; executive, 121, 149, 174, 194, 217; house, 174; legislation, 195; library, 195; Medical Annals, 195; medical care, costs of (See also medical economics) 69, 93; medical defense, 174; medical economics, 246, 273, 300; membership, 195; nominating, 69; program, 121, 174; public information, 174; publication, 174; reference, 195; Tuberculosis Association liaison, 69; tumor registry, 121, 217
  Delegate, A. M. A., 121
  Dues, 43, 44
  Library, donations to, 46
  Membership, changes, 19, 45, 68, 120, 274
    forty years of, 20
  Necrology, 45, 152, 218, 302
  Officers, 121
  President, address, 150
    biography, 174
    message, 173
  Program, Society Activities, 43, 96, 217
  Sections: Internal Medicine, 98, 149, 273
    Neoplastic Diseases, 96, 174
    Nervous and Mental Diseases, 121, 147, 241
    Ophthalmology and Oto-Laryngology, 69, 96, 149, 245, 302
    Pathology and Laboratory Medicine, 174
  Transactions, 19, 68, 120, 149, 274
  Woman's Auxiliary, 45, 97, 125, 175, 276
Medical Societies:
  General:
    American College of Physicians, 22, 44

Subject Index

    - American Medical Association, 124, 302
        - Woman's Auxiliary to, 125
    - American Psychoanalytic Association, 302
    - Association of Military Surgeons, U. S., 276
    - Baltimore City, 302
    - Fairfax County, Va., 275
    - Loudoun County, Va., 195
    - Southern Medical Association, 217, 243
    - Virginia State, 245
- **Local:**
    - Clinical Club, 176
    - Clinico-pathological, 176
    - D. C. Dental Society, 43
    - George Washington University Alumni, 175
    - George Washington University, 176
    - Georgetown Clinical, 176
    - Georgetown University Alumni, 21
    - Hippocrates-Galen, 176
    - International Medical Club, 176
    - Jacobi, 176
    - Kober, 45, 98, 176, 242, 245, 301, 304
    - Mackall, 176
    - Medical Arts, 176, 274
    - Medical Review, 176
    - Osler, 176
    - Officers and meetings, 176
    - Pan-American (D. C. Branch), 176, 275, 301
    - Smith-Reed-Russell, 21, 243, 275, 302
    - Virginia, Maryland and D. C., 152
    - Washington-Baltimore Dermatological, 176, 242
    - Washington-Baltimore Psychoanalytical, 98, 243, 302
    - Washington-Baltimore Urological Society, 302
    - Washington Gynecological, 301
    - Washington Heart Association, 69, 176
    - Washington Medical & Surgical, 176, 273, 274
    - Washington Society of Mental & Nervous Diseases, 176
    - Washington Society of Pathologists, 176
    - Women's Medical Society, 152, 176

- **Medicine,** functional, (Geier) 242-ab
    - internal, fundamentals of, (Yater) 259, 291
- **Medico-legal,** 126
    - apparently in good health prior to the accident, (Garve) 205
    - trial aspect of malpractice cases, (Baker) 58
- **Meningitis,** septic, prophylaxis and treatment of, (Kolmer) 143-ab
- **Necrology:**
    - Barnes, Noble Price, 302
    - DeLaney, Martin Donahue, 45
    - Martin, Lee Ricaud, 45
    - Miner, Francis Hannibal, 218
    - Moffitt, H. Watson, 45
    - Newcomer, Emmett Emerson, 303
    - Rogers, Joseph Decatur, 45
    - Van Rensselaer, John, 218
- **Obstetrics:** effect of certain relaxants upon the uterus during labor, (Dodek) 35
    - full-term abdominal pregnancy, (Mundell) 86
- **Parathyroid** glands in chronic diseases of the bones, rôle of, (Moore) 41
- **Pelvis:** See Surgery
- **Physiological Chemistry:** acid-base equilibrium (Schutz) 138
    - new measurement of oxygen absorbing power, (Zeigler) 225
- **Psychiatry:** life and death instincts, (White) 71
    - psychological plagues: a parable, (Freeman) 242-ab
- **Pyloric stenosis,** congenital hypertrophic, (Cafritz) 38
- **Reprints Received:** 22, 46, 125, 175, 245, 303
- **Sanitation:** Bonus Army: health and sanitary problems, (Cumming) 82
- **Sex:** inadequate sexual function in the male, (Stokes) 50
    - sexual frigidity in women, (Stokes) 264
- **Sinuses,** nasal accessory:
    - as foci of infection, (Jenkins) 179
- **Skin,** functions of, (Teichmann) 12
- **Spleen:** splenic ruptures, (Dardinski) 1
- **Stomach,** hour-glass, a review, (Sager) 76
- **Surgery:** surgical mastoiditis, (Kearny) 160
    - rational surgical approach in pelvic inflammations, (Cusack) 190
    - surgical considerations of carcinoma of the breast, (Kerr) 192-ab
- **Syringobulbia,** report of case, (Casey) 121-ab
- **Thorotrast,** in diagnosis:
    - arteriography and veinography, (Otell, Coe and Hedley) 153
    - encephalography, by cisterna puncture, (Coe, Otell and Hedley), 277
    - ventriculography and encephalography by means of thorium dioxide solution, (Schoenfeld and Freeman), 279
    - hepatosplenography, diagnosis of diseases of liver, (Yater) 156
- **Thyroid Gland:**
    - preoperative and postoperative management of goiter patients, (Strine) 165
    - irradiation treatment of hyperthyroidism, (Pfahler) 99
    - hyperthyroidism, (Merritt) 247
    - hypothyroidism, benign chronic, (Goldenberg) 241-ab
- **Tuberculosis:** let your doctor decide, 92
- **Tumor:** See also Cancer
    - teratoma testis, Aschheim-Zondek test in, (Lindsay) 47
    - spongioblastoma of fourth ventricle, (Kerr) 241-ab
- **Ulcer,** perforated duodenal, (Lewis) 91
    - chronic peptic, in children, (White) 239-ab
- **Urinary Tract:**
    - prostatism, treatment of, by resection, (Dorman) 131
    - prostate, recurrent and malignant obstruction of, (Stirling and Hopkins) 200
    - urethral diverticula in the male, (LeComte and Herschman) 239-ab
- **Veinography:** See Thorotrast in Diagnosis
- **Ventriculography:** See Thoratrast in Diagnosis

Author Index

(a) Indicates abstracts. (d) Indicates discussion. No prefix, indicates articles published in full in Medical Annals of the District of Columbia.

Abbe, T., 219
Abbott, M. E., a-192
Alexander, S. A., 7
Allan, F. N., 23
Ashby, W. M., a-122
Baker, C. S., 58
Ballinger, W. M., d-131
Bennett, A. B., 117
Bier, R. A., 9
Cafritz, E. A., 38
Cahill, J. A., Jr., 137
Casey, F., a-121
Coe, F. O., 153, 277
Cumming, J. G., 82
Cummings, E. J., 203
Cusack, W. J., 190
Daniels, W. B., 104, 282
Dardinski, V. J., 1
Davis, D., d-90
Dodek, S. M., 35
Donnally, H. H., d-58
Dorman, H. N., 131
Dunn, W. L., 112
Ellicott, V. L., 146
Fenning, F. A., 177
Finney, J. M. T., Jr., a-64
Fowler, H. A., d-136
Freeman, W., a-148, a-242, 279
Gager, L. T., d-17, 112
Garve, K., 205
Geier, F. A. J., a-242
Goldenberg, C., a-241
Hagner, F. R., d-131, d-137
Hedley, O. F., 153, 168, 277
Herschman, M. J., a-239
Hickling, D. P., 67
Hohman, L. B., a-148
Hopkins, G. A., 200
Horgan, J., d-130, 197
Jackson, H., Jr., a-16
Jacobs, J. B., d-58
Jenkins, W. H., 179
Karpeles, K. B., d-271
Kearny, R. A., 160
Kerr, H. H., a-192, a-241
Kolmer, J. A., a-143
Langenstrass, K. H., a-122
Lattman, I., 231
LeComte, R. M., a-239
Leffler, H. H., 182
Lewis, J. G., 91
Lindsay, J. W., 47, d-57
Lyons, J. H., 32
McKinley, E. B., a-148
Merritt, E. A., d-131, a-238, 247
Minor, J., d-17, d-57
Moore, C., 41
Mundell, J. J., 86
Otell, L. S., 153, 277
Perry, M. W., 187
Pfahler, G. E., 99
Protas, M., 233
Sager, W. W., 76
Schneider, A., 5
Schoenfeld, H. H., d-118, 279
Schutz, C. A., 138
Selinger, M. A., 54
Stirling, W. C., 200
Stokes, W. R., 50, 264
Strine, H. F., 165
Teichmann, W., 12
Titus, E. W., d-271
Victor, M., 23
Wall, J. S., d-58
Warfield, J. O., Jr., 127
White, C. S., a-239
White, W. A., 71
Yater, W. M., d-112, 156, 259, 291
Zeigler, E. E., 225

Index of Personal Names

Albritton, E. C., 120
Atkinson, W. H., 20
Barber, J. H. M., 20
Barber, R. T. J., 45
Barton, W. M., 46
Bennett, A. B., 174
Bernton, H. S., 194
Bolton, R. M., 19
Borden, D. L., 121, 175
Bronaugh, A. T., 120
Brooks, R. C. A., 45
Bruner, W. Jr., 274
Cahill, J. A., Jr., 195
Campbell, N. D., 274
Carroll, C. T., 274
Caulfield, P. A., 120
Chappell, J. W., 20
Choisser, R. M., 19
Christie, A. C., 69, 194
Clark, G. C., 20
Coale, E. S., 152
Coe, F. O., 174
Cohen, R. S., 19
Conklin, C. B., 121, 195
Costenbader, F. D., 120
Coulter, A. B., 69
Crisp, E. S., 19
Crowley, J. F., 121
Daniels, W. B., 174
Dart, R. O., 274
Davidson, E. Y., 152, 245
DeKleine, W., 120
Dodek, S. M., 19
Dollman, M. C., 45
DuBois, M. B., 45
Dunkley, R. E., 19
Eisinger, W. G., Jr., 20
Ellicott, V. L., 19
Esler, J. W., 149
Fenning, F. A., 44
Flynn, J. A., 20
Fowler, H. A., 121, 194, 302
Freeman, W., 98
Gannon, J. A., 218, 273
Gibbs, O. S., 123
Goodman, E. L., 274
Grass, E. J., 274
Grayson, S. M., 45
Groover, T. A., 69, 273
Halley, C. R. L., 174
Hedley, O. F., 274
Herbst, W. P., Jr., 68
Holm, H. C., 45
Horvath, F. S., 120
Hough, Wm. H., 194
Howard, L. O., 46
Hunter, O. B., 174, 273
Jansen, R. J., 20
Kane, H. F., 301
Karpman, B., 68, 98
King, A. E., 120
King, C. V., 274
LeComte, R. M., 121, 195
Leech, F., 121
Lewis, D., 276
Lindsay, J. W., 217
Livingston, S. K., 45
Luber, S., 19
Lynch, J. J., 45
Lynn, J. G., 19
Lyon, J. A., 70
Lyons, J. H., 174
Macatee, H. C., 121, 195, 273
Mankin, G. H., 120
Mattingly, R. V., 68
Mayer, C. F., 19
McKinley, E. B., 218
McNitt, A., 45
Meloy, W. C., 19
Merritt, E. A., 45, 245
Miller, B., 120
Morgan, W. G., 44, 150, 175
Morris, R. T., 20
Newcomer, E. E., 45, 68
Nicholson, M. M., 121
Parsons, A. V., 45
Potter, W. F., 124
Ramsey, H. P., 45
Richardson, J. J., 45
Riddick, A. L., 121
Rives, W. C., 20, 45
Rosenthal, S. M., 120
Rosser, M. T., 19
Royals, W. C., 45
Ruffin, S., 174
Schwarzmann, J. U., 274
Silverman, I. J., 120
Smith, C. R., 19
Speer, A. J., 19
Stanton, W. J., 174
Talbot, J. A., 273
Tegge, C. W., 120
Thibadeau, R. B., 45
Trible, G. B., 149
Tubman, J. R., 45
Van Rensselaer, J., 20
Vaughan, G. T., 195
Waite, C. P., 19
Wall, J. S., 273
Wallace, C. R., 20
Wenger, W. H., 45
Wetmore, W. O., 45
White, W. A., 97, 98
Willison, E. E., 120
Willson, P., 121, 173, 174
Wilmer, W. H., 245
Yater, W. M., 44, 174, 195

41 C 1263